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Year Nine of the NAFO Subdivision 3Ps Fall GEAC Surveys: Catch Results for Atlantic Cod (*Gadus morhua*), American Plaice (*Hippoglossoides platessoides* F.), Witch Flounder (*Glyptosephalus synoglossus* L.), and Haddock (*Melanogrammus aeglefinus*)

Neuvième année des relevés d'automne du GEAC dans la sous-division 3Ps de l'OPANO : Résultats concernant les prises de morue (*Gadus morhua*), de plie canadienne (*Hippoglossoides platessoides* F.), de plie grise (*Glyptosephalus synoglossus* L.) et d'aiglefin (*Melanogrammus aeglefinus*)

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ABSTRACT

To enhance the fisheries research database in NAFO Subdivision 3Ps, the Groundfish Enterprise Allocation Council (GEAC) has funded surveys each fall from 1997 to 2005 directed at groundfish, with specific interest in cod, American plaice, witch flounder, and haddock. In this analysis, catch statistics, length and age distribution, and stratified analysis estimates of biomass, including age distribution estimates, and interpretation of results are presented. These results have also been presented annually during the regular Regional Stock Advisory Process (RAP) meetings in St. John's.

In 2005, the cod catch weights were about one half those from 2004. There was a continued absence of traditional large catches seen in strata 318 and 319 at the mouth of the Halibut Channel. The survey yielded an abundance estimate of 4.5 million cod and a biomass estimate of 11 kt (compared with the 2004 estimates of 6.6 million cod and 23 kt): the lowest estimates in the nine years of survey. The numbers of cod for the 1998 and 1997 year classes (ages 7 and 8 in 2005) are estimated at one million, down to 30% of the 2004 estimate of 3.6 million, and down to 7% of the 2003 estimate of 15.4 million of these year classes. A greater proportion of younger fish is contributing to the abundance estimate, with 64% of the total estimate in 2005 being from cod aged 3 to 5 years, compared with 33% in 2004. Plaice catch numbers and weights increased by about 30 and 40% respectively compared with those of 2004. The abundance estimate of 40.5 million was up 75% from that in 2004 and the biomass estimate of 39.1 kt was just over double the 2004 estimate. Witch catch numbers and weights were down slightly by about 22 to 30% respectively from 2004. The estimated abundance of 5.4 million was actually up 8% from the 2004 estimate of 5 million, while the estimated biomass of 2.2 kt was down 15% from the 2004 estimate of 2.6 kt. The 2005 haddock catch numbers and weights were comparable to those from the 2004 survey. The abundance estimate of 1.6 million haddock was up 36% from 2004 and is the median for the nine survey years. The biomass estimate of 3.6 kt was up 60% from 2004 and is slightly greater than the nine year average of 3.3 kt and median of 3.1 kt. The general pattern of haddock catches being predominantly of the slopes at the entrance to the Halibut Channel remains. There also continues to be a large inter-annual variability in the magnitudes of the abundance and biomass estimates.

RÉSUMÉ

Pour améliorer la base de données de recherche sur les pêches dans la sous-division 3Ps de l'OPANO, le Groundfish Enterprise Allocation Council (GEAC) a financé des relevés effectués chaque automne, de 1997 à 2005. Ces relevés visent les poissons de fond, principalement la morue, la plie canadienne, la plie grise et l'aiglefin. La présente analyse fournit des statistiques sur les prises, des données relatives à la répartition selon la longueur et l'âge, des estimations de la biomasse obtenues par analyse stratifiée, notamment la répartition selon l'âge, ainsi qu'une interprétation des résultats. Ces résultats ont également été présentés annuellement dans le cadre des réunions régulières du processus consultatif régional sur l'évaluation des stocks, tenues à St. John's.

En 2005, le poids des prises de morue était d'environ la moitié de celles de 2004. On a constaté une absence continue de grosses morues dans les strates 318 et 319 à l'embouchure du chenal du Flétan. Selon ce relevé, l'abondance totale des morues a été estimée à 4,5 millions d'individus et la biomasse totale, à 11 kilotonnes (comparativement à l'estimation de 2004 de 6,6 millions de morues et de 23 kt), soit les plus faibles estimations issues des relevés échelonnés sur une période de neuf ans. Le nombre de morues des classes d'âge de 1998 et 1997 (âges 7 et 8 en 2005) est évalué à un million, soit une baisse de 30 % par rapport à l'estimation de 3,6 millions de 2004 et de 7 % par rapport aux 15,4 millions de 2003. Une proportion accrue de jeunes poissons contribue à l'abondance, puisque 64 % de l'abondance totale de la morue en 2005 sont des morues de 3 à 5 ans, comparativement à 33 % en 2004. Le nombre et le poids des prises de plie canadienne ont augmenté d'environ 30 et 40 % respectivement, comparativement à 2004. L'abondance, estimée à 40,5 millions était en hausse de 75 % relativement à 2004, tandis que la biomasse, évaluée à 39,1 kt correspondait à un peu plus du double de l'estimation de 2004. Le nombre et le poids des prises de plie grise étaient légèrement en baisse d'à peu près 22 à 30 %, respectivement, par rapport à 2004. L'abondance, estimée à 5,4 millions, était en fait supérieure de 8 % à l'estimation de 5 millions de 2004, tandis que la biomasse, évaluée à 2,2 kt avait diminué de 15 % par rapport aux 2,6 kt de 2004. Le nombre et le poids des prises d'aiglefin en 2005 étaient comparables à ceux du relevé de 2004. L'abondance, à 1,6 million, était en hausse de 36 % par rapport à 2004 et représente le point médian des neuf années de relevé. Quant à la biomasse, estimée à 3,6 kt, elle était supérieure de 60 % à celle de 2004, et légèrement plus élevée que la moyenne des neuf années, qui s'établit à 3,3 kt, et que la médiane de 3,1 kt. La tendance générale à la concentration des prises d'aiglefin sur les pentes et à l'entrée du chenal du Flétan n'a pas changé. On continue aussi de noter une grande variation interannuelle des estimations de l'abondance et de la biomasse.

INTRODUCTION

To enhance the fisheries research database in NAFO Subdivision 3Ps, the Groundfish Enterprise Allocation Council (GEAC) has funded surveys each fall from 1997 to 2005 directed at groundfish, with specific interest in cod, American plaice, witch flounder, and haddock. The intent has been to create a series of annual fall surveys in 3Ps to complement current resource assessment activities carried out by the Department of Fisheries and Oceans (DFO). GEAC funded and performed the surveys with scientific guidance from DFO in the design and execution of a stratified random survey and the associated sampling. The data collected during these surveys have been subsequently analysed on behalf of GEAC and for the additional intent of providing this information to DFO, for their databases and their assessment work. These results have been presented annually during the regular Regional Stock Advisory Process (RAP) meetings in St. John's. Companion CSAS Research Documents had been prepared separately up to 2003 for each species analysed in these surveys. Since the 2004 survey, the analyses of all four species are presented under the cover of one Research Document (McClintock, 2005). One trip to perform the 2005 survey was carried out from December 6 to 18, 20051. These dates correspond well with the late-November and December time periods for the previous eight years. During the trip, set details and length frequencies were logged in the DFO Fisheries Form System (FFS) and otoliths were collected for subsequent aging. Catch statistics, length and age distribution, and stratified analysis estimates of biomass, including age distribution estimates, and interpretation of results are presented separately for cod, plaice, and witch. A similar analysis without the length or aging information is presented for haddock.

Under contract to GEAC, AMEC has taken the data logged using the DFO FFS system, combined with the aged otiliths, created digital data files appropriate for inclusion in the DFO databases, and performed a first analysis of the survey results. This document presents these results.

This research document presents the analysis for each of the four species, one species at a time: cod, plaice, witch, and finally haddock. Following a review of methods and materials and an overview of the survey gear net performance, results are presented as follows:

Cod: pages 4-6, Tables 1-4, Fig. 3-11,
Plaice: pages 6-9, Tables 5-8, Fig. 12-19,
Witch: pages 9-10, Tables 9-12, Fig. 20-27,
Haddock: pages 11-12, Tables 13-15, Fig. 28-33.

[1] There was no 2006 survey.

METHODS

A Stratified Random survey was carried out in 3Ps by the M.V. Pennysmart. A summary of the trip is presented below.

TRIP 10: STRATIFIED RANDOM SURVEY

Trip 10 was carried out from 6 to 18 December 2005. This time period is consistent with the 1997-2004 stratified random survey sets. The Pennysmart, the same boat used in the previous surveys, sailed from Marystown for operation in 3Ps, St. Pierre Bank, Halibut Channel, and Green Bank. Figure 1 shows a map illustrating the location of the strata surveyed. The survey was directed at cod, American plaice, witch flounder, and haddock. Set details were collected for all species caught: length, sex, and otolith information were sampled for the cod, plaice, and witch. Weather and sea conditions were generally favourable with the result that no survey time was lost due to weather: two days were lost due to unsuccessful set 37 (see below). Near the end of the survey cod tagging was conducted during 10 sets (numbers 66-73): these are excluded from this survey analysis. Two sets were unsuccessful:

- set 37 was unsuccessful: "main winch broke – had to cut main warps and leave net on bottom for two days – dumped catch"
- set 61 was unsuccessful: "bottom went too deep"

A total of 71 successful sets were completed. This is comparable to the number of successful sets in previous years which range from 73 to 91 and average 83.

Tows of duration 30 minutes using an Engels 96 high lift trawl with a 135 mm diamond mesh cod end (not lined) were conducted. The trawl was fitted with rock hopper foot gear and Bergen #7 trawl doors. The 30 minute tows were commenced once the net reached the bottom.

Performance of the trawl was checked onboard using SCANMAR sensors: bridge display of doorspread and net opening (headline height) was visually monitored and these measurements together with trawl depth and water temperature were noted every five minutes on the written bridge log for most sets. Wingspread was not measured for this trip. The doorspread, clearance, and opening measurements as well as temperature were logged to computer disk using Seatrawl software. The trawl gear and configuration were identical to those used in the 1997-2004 surveys.

Data were logged using FFS with the length and otolith sampling carried out on board. The resulting ages were input to create an age and growth digital file.

SHORE-BASED ANALYSIS

The set details and length frequencies for cod, plaice, and witch were exported from FFS to create ASCII data files. The age and growth data were keyed in following completion of the otolith aging. Cod, plaice and witch were all sampled in 1 cm length groupings, and all ratio/percentages of catch measured were applied. As noted, there was no haddock age or length information collected.

GEAR PERFORMANCE

The survey gear performance was monitored with SCANMAR units mounted on the net. Measurements were digitally logged every 5 seconds with the DFO Seatrawl software and typically noted every 5 min on the bridge log. Doors, opening, and clearance, as well as temperature and depth were recorded for most sets. The digital Seatrawl data were subsequently processed using the AMEC NetPlot Windows software developed for DFO as a Seatrawl data processing and viewing tool.

Statistics were computed from the data with application of typical range checks, in this instance, doorspread in the range [2,100 m], opening in [1,35 m] and clearance in [0,50 m]. Digital data coverage was good with doorspread logged for 66 of the 71 successful sets, and opening and clearance logged for 52 of the 71 sets.

Figures 2a and 2b present the derived net doorspread and opening statistics for each set. The mean +/- one standard deviation are shown. The mean doorspread is 67 m compared with means in the range 71-78 m from 1999 to 2003 and 89 m in 2004. Some of the mean statistics can be a little misleading, e.g. for set 28 the mean is 30 m but this is based on only 24 good data points equating to about 2 minutes of the 30 minute tow. Similarly for set 14, there are only six valid data points.

Mean opening in 2005 is 4.9 m compared with means of 3.8 m in 2004, 4.4 m in 2003 and 5.0 to 5.4 m for 2000-02. Computation of the 2004 and 2005 statistics were with the new NetPlot software compared with a traditional Seatrawl software processing stream: this may explain some of the differences.

There are about 15 sets with mean doorspread between 50 and 60 m, and about 19 sets with means larger than 80 m, the largest being 94 m for set 75. The median doorspread is 69 m. In general, the greater the depth, the greater the doorspread (Fig. 2d). Mean opening values are all in the range 2.6 to 6.6 m.

Figure 2c presents clearance with means that range from 0 to 1.3 m. The mean clearance is 0.25 m compared with values near 0.5 m from 2001-03 and 0.16 m in 2004. Figure 2d presents the mean doorspread versus set depth. The average mean set doorspread is 59 m for the 44 sets in depths less than 150 m and 68 m for the 27 sets in greater depths.

As noted, wingspread was not recorded. Recent mean values, for the last three .years 2001-03 for which measurements were taken, have been on the order of 16.4-18.5 m (approximately 60 ft).

There appears to be good consistency in the net performance opening and clearance measurements for most of the sets, although for some periods of the survey, e.g. sets 2-7 and 19-34, the variability in doorspread within a given set appears to be higher than is desirable. It is essential that the net performance should be carefully monitored in any future surveys.

The vessel and gear are the same as previous years and there is nothing apparent in the 2005 survey measurements to suggest a drastic change in net performance. It is unfortunate there was no measurement of wingspread. Nevertheless, a more detailed comparison of net performance and mensuration should be undertaken in the future. For the present though, the assumption is made here to use the same 60 ft wingspread value

for the stratified analysis that has also been used for the other years. This is appropriate for preserving the eight or nine year relative index of abundance for each species.

For each species, abundance and biomass were estimated using the DFO stratified analysis STRAP software and applying the French Exclusion Zone around St. Pierre et Miquelon for area calculations. Consistent with all survey analyses since 1997, a wingspread of 60 ft was used.

RESULTS: COD

ACON[2] scaled symbol plots of the spatial distribution of catch weights are presented in Fig. 3 and include the corresponding catch results from the 1997-2004 surveys. As has been the historical pattern for the survey, any large catches were located at the southern entrance to the Halibut Channel and on the western portion of St. Pierre Bank. In 2005, the set catch weights of 100 kg or greater are fewer in number and smaller in magnitude than in previous years.

Table 1 presents a summary of the cod set details and catch numbers and weights. The mean cod catch for the 71 stratified random sets is 8 fish and the mean catch weight is 20 kg. This is down noticeably compared with 10 and 31 kg in 2004, 45 and 136 kg in 2003, 47 and 114 kg in 2002, 48 and 90 kg in 2001 and 72 and 370 kg in 2000. The total number of cod caught was 554 in 2005 compared with 872 in 2004, 3982 in 2003, 3543 in 2002, 4340 in 2001 and 5247 in 2000. The total catch weight was 1446 kg in 2005 compared with 2697 kg in 2004, 12,101 kg in 2003, 8571 kg in 2002, 8195 kg in 2001 and 26,992 kg in 2000. The largest catch of 103 cod and weight 320 kg was from set 60 in stratum 318 at a depth of approximately 245 m at the mouth of the Halibut Channel. There is a noticeable absence of the traditional large catches in strata 318 and 319.

Figures 4a to 4c show summaries of the total and maximum number of cod caught, the total and maximum cod weights, and the largest catch weights over the survey years, respectively. Evident in Fig. 4a and 4b are the reductions in numbers and weights of cod which are about 54 to 64% of their 2004 values, respectively and about 12 to 14% of the 2003 values.

Figure 4c shows the largest sets for each of the nine survey years. The largest sets in four of the years are greater than the 5000 kg scale shown: the largest sets in 1998, 2000, 2002, and 2003 are 8035 kg, 17,083 kg and 5007 kg, 7020 kg, and 8330 kg respectively. As with 2004, for 2005, there is an absence of at least one or two large sets which had generally been the norm in previous years.

COD AGE AND LENGTH COMPOSITION

Figures 5a and 5b present the sampled length compositions of the first four and most recent five survey years. In 2004 the sampled lengths are generally between about 42 and 63 cm with a peak in the distribution at 47 cm, compared with 2004 where lengths are largely from 50 to 80 cm and peak at 58 cm. In 2005 there are more smaller fish in the 38

[2] Black, J. 1991. ACON Data Visualization Software, Dartmouth (NS), Fisheries and Oceans Canada, Maritimes Region; Available from: http://www.mar.dfo-mpo.gc.ca/science/acon/

to 50 cm range compared with 2004 and a similar, albeit in lesser numbers, distribution to 2001.

Figures 6a and 6b present age composition of the 2005 sampled cod. Figure 6a presents length versus age distribution. The mean sampled length from the aged cod was 61 cm compared with 66 and 67 cm in 2004 and 2003 respectively. Mean lengths for 1997 to 2002 were 63.5, 68.8, 63.9, 70, 65 and 62.9 cm respectively. The maximum lengths sampled for years 1997 through 2004 ranged from 103 to 118 cm (113 cm in 2004). In 2005 the maximum length was 119 cm. The mean sampled age for 2005 was 5.4 years compared with 6 years in 2004. Mean ages for 1997-2003 were 5.8, 6.4, 6.1, 6.6, 6.1, 5.4 and 6.1 years respectively. The maximum ages sampled for 1997 through 2005 were 12, 15, 13, 14, 16, 13, 15, 16, and 12 respectively. There were few sampled fish in 2005 older than 8 years. Figure 6b presents the sampled numbers of fish at age, stacking the total numbers from each year in the bars. The greatest numbers of cod in 2005 are of age 3, then ages 4 and 7. A total of 414 otoliths were taken in 2005 compared to 456 in 2004, 491 in 2003, 502 in 1997, 450 in 1998, 551 in 1999, 678 in 2000, 607 in 2001, and 422 in 2002.

COD ABUNDANCE AND BIOMASS ESTIMATES

Table 2a presents the STRAP output of estimated abundance and biomass. The estimated total number of cod for 3Ps is 4.5 million (with a 95% confidence lower and upper limits of 2.5 and 6.5 million). The mean number of cod per standard 1.5 nautical mile tow is 5 fish (with limits of 3 and 8). The estimated total cod biomass is 11.5 kt (with lower and upper limits of 6.5 and 16.4 kt). The mean catch weight per tow is 13 kg.

Table 2b presents a summary comparison of these abundance and biomass STRAP estimates for 1997-2005.

The 2005 abundance estimate of 4.5 million is 68% of the estimate of 6.6 million from 2004. The biomass estimate of 11.5 kt is about one half that of 2004 and is the lowest value from any of the survey years. The mean number of fish per tow for 2005 is about two thirds the 2004 value of 7.6 and one fifth the 2003 value of 25.1. The mean catch weight per set in 2005 is one half that of 2004 and 16% of the 2003 estimate. There are large variances to the estimates in some years which yield negative lower limits: zero values are shown in the tables. Large variances can result when there are large differences in the catch sizes obtained for the different sets fished in a given stratum.

Table 3a presents the STRAP age composition of numbers per tow, with sexes combined. The total mean number per tow is 5.2 with the greatest numbers estimated at ages 3 (1.7 fish per tow) and 4 (1.2 fish per tow). Lesser numbers are at ages 7 (0.7 fish) and 8 (0.5 fish). Table 3b presents a comparison of the estimated abundances and mean numbers of fish per tow for 1997-2005. The 2005 age 7 estimate of 0.64 million cod is less than one quarter the 2004 age 6 estimate of 2.6 million, if one follows that year class. For the first time since the 1997 survey there are no cod sampled older than 12 years. The numbers of cod for the 1998 and 1997 year classes (ages 7 and 8 in 2005) are estimated at one million, down to 30% of the 2004 estimate of 3.6 million, and down to 7% of the 2003 estimate of 15.4 million of these year classes. A greater proportion of younger fish is contributing to the abundance estimate, with 64% of the total estimate in 2005 being from cod aged 3-5 years, compared with 33% in 2004.

Tables 4a and 4b present the cod abundance and biomass estimates by strata for 1997-2005, arranged by depth regime. The overall abundance estimate (Table 4a) of 4.5 is two thirds the 2004 estimate and 20% of the 21.9 million value from 2003. The largest differences compared with 2004 are a reduction of about 2 million cod from the stratum 319 estimate, and a drop of 0.7 million cod for stratum 315. Conversely there is an increase of about 0.5 million cod for 2005 compared with 2004 for the shallower strata less than 30 fathoms. Most of the other strata estimates are comparable with 2004. A similar pattern is shown in Table 4b for biomass, where for example the stratum 315 and 329 estimates are 18 and 27% of their 2004 estimates respectively and the total estimate of 11.5 t is half the 2004 estimate.

Figure 7 shows a 3-D histogram of the abundance estimates by age (Table 3b) for all survey years with a large reduction in numbers at all ages in 2005, not just ages 3-6 for which some progression was seen from 2001-03.

Figure 8 presents the STRAP-estimated abundance at length values for all sexes combined. From 1997 to 1998 the data indicate a "bottoming out" of sorts, and in 2000 there was a visible increase in the length distribution peaking from 1998 to 1999 to 2000, a consistent increase of approximately 6 cm each year from 61 cm in 1998 to 67 cm in 1999 to 73 cm in 2000. This increase disappeared in 2001 with there being few fish over 65-70 cm in length. There was evident growth from 2001 to 2002 with the peak located at 49 cm in 2001 and at 61 cm in the 2002 survey. In 2003, the peak of about 2.5 million is at 67 cm although this is less than half the 2002 value of 6 million. In 2004, the distribution is much smaller than that of 2002 and 2003 and more in line with the lower distribution of 1998. The 2005 distribution is flattened out still further with no length abundance estimate greater than 0.5 million and overall with very little resemblance in the distribution to years past.

Figures 9 and 10 present 3-D histograms of the abundance and biomass estimates grouped by strata for all years. The reduction in numbers for either of the traditionally well-represented strata 318 and 319 at the mouth of the Halibut Channel is evident. Figure 11 compares the abundance and biomass estimates by considering totals with all strata and without the two strata 318 and 319. Excluding contributions from these strata, the 2005 abundance estimates are comparable to those for 2004, while the 2005 biomass estimate is reduced by about 40% from 2004.

COD SUMMARY

In 2005, the cod catch weights were about one half those from 2004. There was a continued absence of traditional large catches seen in strata 318 and 319 at the mouth of the Halibut Channel. The survey yielded an abundance estimate of 4.5 million cod and a biomass estimate of 11 kt (compared with the 2004 estimates of 6.6 million cod and 23 kt): the lowest estimates in the nine years of survey.

The numbers of cod for the 1998 and 1997 year classes (ages 7 and 8 in 2005) are estimated at one million, down to 30% of the 2004 estimate of 3.6 million, and down to 7% of the 2003 estimate of 15.4 million of these year classes. A greater proportion of younger fish is contributing to the abundance estimate, with 64% of the total estimate in 2005 being from cod aged 3-5 years, compared with 33% in 2004.

RESULTS: PLAICE

ACON plots of the spatial distribution of American plaice catch weights are presented in Fig. 12 and include the corresponding catch results from the 1998 to 2004 surveys. The 2005 survey shows a catch distribution similar to the previous years with catches located along the western and southwestern slopes of the St. Pierre Bank and at the southern entrance to the Halibut Channel. The largest catch was set 48 with 1034 plaice and a set catch weight of 1212 kg. The set was located in stratum 317 in a water depth of 127 m on the western portion of St. Pierre Bank just south of 46°N and west of the French Exclusion Zone corridor (a similar location to the largest set in the 2004 survey). The next largest sets, set 58 (891 plaice, 866 kg) and set 56 (953 plaice, 624 kg), were located at the southern entrance to the Halibut Channel.

Table 5 presents a summary of the plaice set details and catch numbers and weights. The mean plaice catch for the 71 stratified random sets is 62 fish and the mean catch weight is 58 kg. These numbers are larger than the preceding three years 2002-2004 where the mean number of fish ranged from 30 to 39 and the mean catch weight ranged from 27 to 33 kg. For the earlier 1999, 2000, and 2001 surveys the mean values were 55, 53, and 63 fish and mean catch weights of 36, 37, and 39 kg respectively. A catch of plaice was reported in 58 of the 71 successful sets. A total of six sets had catches over 100 kg (the same statistic as 2004), with four sets over 200 kg (three in 2004).

Figures 13a-13c show summaries of the total and maximum number of plaice caught, the total and maximum plaice weights, and the largest catch weights, respectively over the survey years. The total numbers are up 30% from 2004: it is noted as well the number of sets was 71 in 2005 compared with 86 in 2004. The largest set numbers are comparable at 1034 up about 8% from the largest set of 955 plaice in 2004. The total catch weight of 4069 kg is up about 42% from 2003. The largest set weights are all greater in 2005 compared with their 2004 counterparts. There is a general increasing trend over the past four survey years.

LENGTH AND AGE

Figures 14a and 14b present the sampled length compositions for all survey years. For 2005, the fish sampled range in size from 21 cm up to 70 cm. The distribution shows a peak at 35 cm below the sampled mean of 42 cm. The shape of the distribution in 2005 is quite similar to previous years, particularly the 2004 curve. There is a greater percentage of larger plaice of length 55 to 66 cm compared with the 2004 survey.

Figures 15a and 15b present age composition of the 2005 sampled plaice. Figure 15a presents length versus age distribution. The mean age of 723 sampled plaice was 10.3 years, comparable to 10 years for 2002-04, 9.6 years in 2001, and 9.5 years in 2000. The youngest and oldest fish were 4 and 19 years. Figure 15b presents a bar chart of the sampled numbers of plaice at age for all years. The number of sampled plaice in 2005 is comparable to that from the previous years and the overall shape of the age distribution remains consistent (See also Figure 16).

In 2005 the numbers of plaice ages 5 and 6 are decreased by about a factor of two from 2004 and for ages 7-10 the numbers are comparable to or slightly larger than those from

2004. For ages 11-16 the 2005 numbers are comparable or slightly less than those from 2004.

STRATIFIED ANALYSIS

Table 6a presents the STRAP output of estimated abundance and biomass. The estimated total number of plaice for 3Ps is 40.5 million (with an upper 95% confidence limit of 67.9 million). The mean number of plaice per standard 1.5 nautical mile tow is 47. The estimated total plaice biomass is 39.1 kt. The mean catch weight per tow is 45 kg.

Table 6b presents a summary comparison of abundance and biomass STRAP estimates for all years. The 2005 total abundance and mean number of fish per tow estimates are increased by 75% from 2004. The 2005 biomass estimates are just over twice the 2004 estimates. The 2005 estimates are the largest since the 2001 survey.

Table 7a presents the STRAP age composition of numbers per tow, with sexes combined. The total mean number per tow is 46.6. The greatest numbers estimated are at ages 7-10 (from 6 to 7.2 fish per tow). Lesser numbers of fish are estimated for age 11 (4.4 fish per tow) and ages 12-15 (2-3 fish per tow).

Table 7b presents an age summary comparison of abundance STRAP estimates. Except for fish aged 11-13 (1992-94 year classes) for which the numbers in 2005 are comparable to those of 2004, the number of fish for 2005 are about double those from 2004.

Tables 8a and 8b present the plaice abundance and biomass estimates by strata for all eight survey years, arranged by depth regime. Consistent with previous years, most of the plaice are estimated to be present in the three depth regimes shallower than 100 fathoms. For strata 317 and 319 in the 51 to 100 fathom range, the 2005 estimates are from two to four times larger than their 2004 counterparts. Conversely for similar depth strata 311 the 2005 estimates are less than half, although the magnitudes are much less, on the order of 1 million fish. The total 2005 estimate in this regime is 2.3 times larger than the 2004 estimate. The 2004 and 2005 total estimates of 9.6 million plaice for depths less than 50 fathoms are within 1% of each other. Just 3% of the abundance estimates for 2005 are in depths greater than 100 fathoms, similar to previous years were typically from 2 to 5% only are in these deeper strata. The biomass estimates shown in Table 8b illustrate a similar picture.

Figure 16 shows a 3-D histogram of the abundance estimates by age for all survey years. The age distribution shape shows a general consistency through all years and a total abundance estimate of 40.5 million plaice that is 55 to 75% greater than each of the previous three years 2002-04 and is about 68% of the largest estimate from all survey years of 59 million from 2001.

Figure 17 presents the STRAP-estimated abundance at length values for all sexes combined. The greater differences for 2005 include greater numbers of fish at lengths 32 to 38 cm compared to the previous three years and greater numbers compared to all years for lengths greater than about 50 cm. The 2005 peak of about 5 million is at 38.5 cm. This compares with peaks of 6.6 to 9.5 million at lengths 36.5 to 38.5 cm for 1999 to 2001.

Figures 18 and 19 present 3-D histograms of the abundance and biomass estimates grouped by strata for all years. As presented in Tables 8a and 8b, the general patterns of strata with greatest numbers in each of the first three depth regimes is seen consistently for all years.

PLAICE SUMMARY

In 2005, the plaice catch numbers and weights increased by about 30 and 40% respectively compared with those of 2004. The abundance estimate of 40.5 million was up 75% from that in 2004 and the biomass estimate of 39.1 kt was up about 108% from 2004. The greatest increases were seen for older fish at lengths greater than 50 cm and for ages about 7-10 and lengths 32-38 cm. The primary locations for plaice continue to be along the western portion of the St. Pierre Bank and at the entrance to Halibut Channel.

RESULTS: WITCH

ACON plots of the spatial distribution of catch weights are presented in Fig. 20 and include the corresponding catch results from the 1998 to 2004 surveys. The 2005 survey shows most catches located along the slopes of the St. Pierre Bank, southwest of St. Pierre and south to the Halibut Channel, and in water depths typically between about 150 and 400 m. The largest catch in the 2005 survey was 159 witch weighing 77 kg located in stratum 318, at the southwestern tip of St. Pierre Bank in a water depth of 208 m.

Table 9 presents a summary of the witch set details, catch numbers and weights. A total of 718 witch with total weight 306 kg were caught (compared with totals of 928 and 437 kg in 2004). Witch was caught in 31 of the 71 sets. About half of these sets were of 10 witch or less. This general pattern is similar to previous years.

Figures 21a-21c summarize the total and maximum number of witch caught, the total and maximum witch weights, and the largest catch weights over the survey years, respectively. The numbers are generally down from 2004 and 2003 but quite comparable to the 2002 catch statistics. The total numbers of witch caught in 2005 are 77% of the 2004 total, and the total catch weight of 306 kg is 70% of the 2004 value. As shown in Fig. 21c, the largest sets in 2005 are slightly smaller but still comparable to those from 2004.

LENGTH AND AGE

Figures 22a and 22b present the length composition of the 2005 survey together in two views with the first three and most recent four surveys years. For 2005, the sampled fish ranged in size from 26 cm up to 56 cm, with a mean length of 39 cm and a peak in the distribution at 40 cm. The overall shape is quite similar to recent years.

Figures 23a and 23b present age composition of the 2005 sampled witch. Figure 23a presents length versus age distribution. The mean age of 452 sampled witch was 8.7 years comparable to the other years. The mean was 9 years in 2004, 8.8 years in 2003, 8.7 years in 2002, 9.1 years in 2000 and 2001, 8.9 years in 1999, and 8.8 years in 1998. The youngest and oldest fish sampled were 5 and 14 years (same as 2004).

Figure 23b presents a bar chart of the sampled percent occurrence of witch at age for 1998-2005. The numbers of sampled witch are not the same for each survey year, although for the past five years the numbers are comparable. The numbers at age are quite similar and stable for the past few years. For 2005 the numbers of ages 6 to 9 are about 2 to 15% greater than their 2004 counterparts; for ages 5, 11, and 12, the 2005 numbers are 67 to 75% of the 2004 numbers; and for age 13 the 2005 number of 7 witch is about one third the 2004 sample of 20.

STRATIFIED ANALYSIS

Table 10a presents the STRAP output of estimated abundance and biomass. The estimated total number of witch for 3Ps is 5.4 million. The mean number of witch per standard 1.5 nautical mile tow is 6.2. The total biomass is 2.2 kt and the mean catch weight per tow is 2.6 kg. Table 10b presents a summary comparison of abundance and biomass STRAP estimates. The abundance estimate for 2005 is up slightly about 8% compared to 2004, while the biomass estimate is down 15%, all comparable to the estimates from the previous three to five years. The upper and lower limits continue to reflect considerable variance in the estimates.

Table 11a presents the STRAP age composition of numbers per tow, with sexes combined. The total mean number per tow is 6.2. The greatest numbers estimated are at ages 9 (1.5 fish per tow), 8 (1.4 fish), 7 (1.1 fish) and 10 (0.9 fish). Table 11b presents an age distribution summary comparison of abundance STRAP estimates for all years. Estimates are comparable for all ages compared with 2004. Figure 24 shows a 3-D histogram of the abundance estimates by age for all survey years. The age distribution shows consistency through all years and the total abundance estimate in 2005 is comparable to those of 2004 and 2002, not quite as large as the 2003 estimate.

Tables 12a and 12b present the witch abundance and biomass estimates by strata, for all years, arranged by depth regime. In 2005 there is a complete absence of witch in the strata surveyed less than 50 fathoms. Compared with 2004 there is a slight redistribution of witch with increased numbers estimated in 2005 for the 51-100 fathom (up 60% from 2004) and 151-200 fathom (up 71% from 2004) regimes and decreased numbers estimated for the 101-150 fathom (down 24% from 2004) and 201-301 fathom (down 33% from 2004). Similar increases and decreases are seen for biomass, with increased estimates in 2005 for the 51-100 fathom (up 51% from 2004) and 151-200 fathom (up 40% from 2004) regimes and decreased predictions for the 101-150 fathom (down 25% from 2004) and 201-301 fathom (down 65% from 2004).

Figure 25 presents the STRAP-estimated abundance at length values for all sexes combined for all eight survey years. The 2005 estimated length distribution is quite similar to that from 2004, 2002 and 1998, with a peak of 0.9 million in 2005 at 36.5 cm. Figure 25 is particularly illustrative of the three witch distribution patterns seen in the surveys: one from 2000, 2001, and 2003; a second in 1998, 2002, 2004, and now 2005; and the year effect in 1999.

Figures 26 and 27 present 3-D histograms of the abundance and biomass estimates grouped by strata for all years. As presented in Tables 12a and 12b, the general patterns of strata with greatest numbers in the four deepest depth regimes is seen consistently throughout the survey years. Most the estimates are from strata 317/319 in the 51-100

fathom regime, strata 313/318 from the 101-150 fathom regime, and 707/708 from the two deepest regimes 151-200 and 201-300 fathoms.

Witch Summary

In 2005, the witch catch numbers and weights were down slightly by about 22 and 30% respectively from 2004. The estimated abundance of 5.4 million was actually up 8% from the 2004 estimate of 5 million, while the estimated biomass of 2.2 kt was down 15% from the 2004 estimate of 2.6 kt. The distribution of witch ages and lengths remains consistent as does the primary catch locations along the western slopes of St. Pierre Bank and near the entrance to Halibut Channel. In 2005 catches were exclusively in depths greater than 50 fathoms.

RESULTS: HADDOCK

ACON plots of the spatial distribution of catch weights and numbers are presented in Fig. 28a and 28b. In virtually all years, the haddock catches are located primarily at the southern entrance to the Halibut Channel and in lesser magnitudes on the western portion of St. Pierre Bank, just west and southwest of St. Pierre et Miquelon. Many of the remaining sets in the surveys had no haddock. This pattern is generally consistent over time.

Table 13 presents a summary of the haddock set details and catch numbers from the 2005 survey. A summary of set catch numbers and weights for all survey years is presented in Table 14. For each of the survey years, the survey trip dates and numbers of sets, number of sets with haddock, and the maximum, mean, and total numbers and weights are reported. On average at least one haddock was caught in 11 sets each survey trip as was the case in 2004. In 2005, five of the 11 sets with haddock are of a single haddock: weights ranging from 2 to 6.5 kg.

The mean number of haddock per set is 2.8 in 2005 compared with the 2004 value of 2.3. The mean set weight is 6.5 kg in 2005 down from 4.2 kg in 2003. Other than the 2001 and 2003 surveys these numbers are generally in keeping with the survey results of other years. Both the 2001 and 2003 surveys reported much higher catches than the other years.

Figure 29 presents six graphs illustrating the range of haddock catch values exhibited over the seven years. Figures 29a and 29b report the haddock weights and numbers for the five largest sets each year. As noted, 2001 and 2003 exhibited the largest sets. Excluding these years, the largest sets are generally between 100 and 200 kg and 40 and 140 haddock, with 1998 again being much lower than this. In 2005 the largest set was 91 haddock with a weight of 189 kg. The number of survey sets and the number of sets with haddock caught are shown in Figure29c and here the pattern is pretty consistent in all years: from 8 to 20% of survey sets report a catch of haddock. Figure 29d presents the mean weight per fish for each survey, defined as the ratio of the total weights to total numbers. This value ranges between 0.9 and 3 kg and is generally on the order of 2 kg.

Abundance and Biomass Estimates

Tables 15a and 15b present the STRAP output of estimated abundance and biomass. The estimated total number of haddock for 3Ps ranges from 0.22 million in 1998 to 6 million in 2001. The 2005 estimate is 1.6 million. Biomass estimates in Table 15b illustrate a similar pattern to the abundance. The total 3Ps haddock biomass estimates range from 0.7 kt in 1998 to 6.4 kt in 2001. The 2005 estimate is 3.6 kt. In most years the estimates are present in the 51 to 100 fathom and 101 to 150 fathom regimes. There are generally few haddock in the shallowest regime of less than 30 fathoms, except for 2001 when approximately 13% of the total abundance estimate and 28% of the total abundance estimate.

Figure 30 presents a 3d chart of the annual distribution of abundance estimates, where the percent of the total abundance in each stratum is shown. The predominance of haddock in strata 319 and 318 is clear. Small contributions are also seen in the shallower strata 314, 320, and 312 and in strata 310, 313, and 316 in the 101-150 fathom regime, prior to 2002. For the past four years the stock is almost exclusively found in strata 319 and 318 with from about 2 to 6% also coming from stratum 310.

Figures 31 and 32 present 3d histograms of the abundance and biomass estimates grouped by strata for all years. As presented in Tables 15a and 15b, the general patterns of strata with greatest numbers in strata 318 and 319 at the mouth of the Halibut Channel are clearly shown. The annual variation in the total estimates of abundance and biomass is also seen with no clear trend evident.

Figure 33 reports the mean number of fish per tow and mean weight per tow from the stratified analysis for each of the surveys. The mean number of haddock per tow ranges from 0.3 in 1998 and 1.2 in 1999 to 4.1 in 2003 and 6.9 in 2001. The 2005 value is 1.9. The mean weight per tow ranges from 0.8 kg in 1998 and 2.9 kg in 1999 to 5.8 kg in 2003 and 7.4 in 2001. The 2004 value is 4.2 kg.

Haddock Summary

The 2005 haddock catch numbers and weights were comparable to those from the 2004 survey. The abundance estimate of 1.6 million haddock was up 36% from 2004 and is the median for the nine survey years. The biomass estimate of 3.6 kt was up 60% from 2004 and is slightly greater than the nine year average of 3.3 kt and median of 3.1 kt. The general pattern of haddock catches being predominantly of the slopes at the entrance to the Halibut Channel remains. There also continues to be a large inter-annual variability in the magnitudes of the abundance and biomass estimates.

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Table 1. Summary of cod catches for stratified random survey, NAFO Subdivision 3Ps, 6-18 December 2005.

M.V. Pennysmart Trip	Set	Year	Month	Day	StrLin	Division	Unit Area	Depth (m)	Set Location Lat (N)	Long (W)	COD Catch # of Fish	Catch Weight (kg)	Set Duration (min)	Tow Distance (n.mi.)	COD Mean Weight (kg)
10	1	5	12	6	322	3P	M29	172	46.62	55.05	4	5	30	1.5	1.3
10	2	5	12	6	322	3P	M30	146	46.48	55.09	9	16	30	1.5	1.8
10	3	5	12	6	322	3P	M30	153	46.43	55.34	8	16	30	1.5	2.0
10	4	5	12	6	322	3P	M30	167	46.30	55.02	1	1.5	30	1.5	1.5
10	5	5	12	6	324	3P	N30	101	46.29	54.60	1	0.4	30	1.5	0.4
10	6	5	12	6	324	3P	N30	119	46.21	54.45	0	0	30	1.6	
10	7	5	12	6	325	3P	N30	83	46.13	54.75	2	0.5	30	1.6	0.3
10	8	5	12	7	323	3P	N30	144	46.09	54.84	1	1	30	1.5	1.0
10	9	5	12	7	323	3P	M30	148	46.00	55.25	0	0	30	1.5	
10	10	5	12	7	322	3P	M30	126	46.25	55.66	0	0	30	1.5	
10	11	5	12	7	321	3P	M30	56	46.14	55.75	2	12	30	1.4	6.0
10	12	5	12	7	321	3P	M30	80	46.24	55.86	0	0	30	1.5	
10	13	5	12	7	322	3P	M30	129	46.31	55.76	2	3.5	30	1.5	1.8
10	14	5	12	7	322	3P	M30	137	46.48	55.78	0	0	30	1.5	
10	15	5	12	8	321	3P	M31	60	45.74	55.57	0	0	30	1.5	
10	16	5	12	8	321	3P	M31	81	45.69	55.40	0	0	30	1.5	
10	17	5	12	8	323	3P	M31	148	45.74	55.35	16	23	30	1.5	1.4
10	18	5	12	8	323	3P	M31	138	45.64	55.11	0	0	30	1.5	
10	19	5	12	8	325	3P	N31	63	45.69	54.92	1	1.2	30	1.5	1.2
10	20	5	12	8	325	3P	N31	69	45.85	54.79	0	0	30	1.5	
10	21	5	12	8	325	3P	N31	80	45.85	54.70	0	0	30	1.4	
10	22	5	12	8	326	3P	N31	81	45.74	54.43	0	0	30	1.5	
10	23	5	12	8	326	3P	N31	84	45.56	54.43	0	0	30	1.6	
10	24	5	12	8	325	3P	N31	78	45.55	54.88	1	22	30	1.5	22.0
10	25	5	12	8	319	3P	N31	104	45.55	54.99	0	0	30	1.5	
10	26	5	12	9	319	3P	M32	128	45.50	55.38	31	38	30	1.5	1.2
10	27	5	12	9	315	3P	M31	70	45.50	55.54	6	59	30	1.5	9.8
10	28	5	12	9	320	3P	M31	55	45.65	55.66	5	36	30	1.5	7.2
10	29	5	12	9	321	3P	M31	67	45.80	55.49	1	3	30	1.6	3.0
10	30	5	12	9	321	3P	M31	67	45.91	55.69	3	2.5	30	1.6	0.8
10	31	5	12	9	320	3P	L31	49	45.78	56.07	35	47	30	1.5	1.3
10	32	5	12	9	320	3P	L31	48	45.79	56.49	5	14	30	1.5	2.8
10	33	5	12	9	320	3P	L31	52	45.95	56.51	0	0	30	1.6	
10	34	5	12	9	314	3P	L30	54	46.22	56.69	3	3	30	1.5	1.0
10	35	5	12	10	312	3P	L30	63	46.20	56.76	6	71	30	1.5	11.8
10	36	5	12	10	314	3P	K30	47	46.29	57.01	0	0	30	1.5	
10	38	5	12	13	312	3P	K29	77	46.74	57.03	49	63	30	1.5	1.3
10	39	5	12	13	311	3P	K29	100	46.81	57.04	8	6.5	30	1.6	0.8
10	40	5	12	13	310	3P	K29	219	46.81	57.30	39	79	30	1.6	2.0
10	41	5	12	13	310	3P	K29	243	46.77	57.37	49	165	30	1.5	3.4
10	42	5	12	13	313	3P	K29	262	46.63	57.50	59	101	30	1.6	1.7
10	43	5	12	13	313	3P	K29	206	46.50	57.44	8	26	30	1.5	3.3
10	44	5	12	14	311	3P	K30	136	46.25	57.19	0	0	30	1.5	
10	45	5	12	14	705	3P	K30	340	46.12	57.28	2	4	30	1.5	2.0
10	46	5	12	14	705	3P	K30	321	46.07	57.18	1	8	30	1.6	8.0
10	47	5	12	14	706	3P	L31	356	45.80	56.93	0	0	30	1.6	
10	48	5	12	14	317	3P	L31	125	45.69	56.63	1	0.5	30	1.5	0.5
10	49	5	12	14	316	3P	L31	231	45.61	56.60	8	29	30	1.5	3.6
10	50	5	12	14	316	3P	L31	203	45.56	56.55	1	5.5	30	1.5	5.5
10	51	5	12	14	706	3P	L32	353	45.30	56.49	1	0.3	30	1.5	0.3
10	52	5	12	14	315	3P	L32	77	45.20	56.10	3	11	30	1.5	3.7
10	53	5	12	15	320	3P	M32	46	45.43	55.93	1	2.5	30	1.5	2.5
10	54	5	12	15	315	3P	M32	76	45.22	55.78	6	20	30	1.5	3.3
10	55	5	12	15	315	3P	M32	79	45.05	55.80	1	6	30	1.5	6.0
10	56	5	12	15	317	3P	M33	127	44.95	55.94	9	15	30	1.4	1.7
10	57	5	12	15	318	3P	M33	208	44.91	55.92	12	40	30	1.4	3.3
10	58	5	12	15	319	3P	M32	114	45.02	55.59	17	61	30	1.4	3.6
10	59	5	12	15	707	3P	M33	323	44.99	55.53	1	1.5	30	1.5	1.5
10	60	5	12	15	318	3P	M32	245	45.03	55.37	103	320	30	1.5	3.1
10	62	5	12	16	707	3P	N32	338	45.06	54.76	0	0	30	1.5	
10	63	5	12	16	319	3P	N32	101	45.15	54.78	3	21	30	1.5	7.0
10	64	5	12	16	319	3P	M32	155	45.37	55.15	1	1	30	1.6	1.0
10	65	5	12	16	319	3P	M32	168	45.31	55.36	21	64	30	1.4	3.0
10	74	5	12	17	708	3P	M33	425	45.00	55.49	4	15	30	1.6	3.8
10	75	5	12	17	708	3P	M33	506	44.91	55.59	2	1.5	30	1.5	0.8
10	76	5	12	17	711	3P	L32	390	45.14	56.51	0	0	30	1.5	
10	77	5	12	17	711	3P	L32	392	45.39	56.75	0	0	30	1.6	
10	78	5	12	18	712	3P	L31	410	45.60	56.96	0	0	30	1.6	
10	79	5	12	18	712	3P	K31	411	45.88	57.10	1	3	30	1.5	3.0
10	80	5	12	18	713	3P	K31	486	45.98	57.62	0	0	30	1.5	
10	81	5	12	18	713	3P	K30	456	46.17	57.60	0	0	30	1.6	
									Minimum		0.0	0.0	30.0	1.4	0.3
									Maximum		103.0	320.0	30.0	1.6	22.0
									Mean		7.8	20.4	30.0	1.5	2.6
									Median		1.0	3.0	30.0	1.5	2.0
									Standard Error		0.2	0.6	0.0	0.0	0.1
									Total		554.0	1445.9			

Notes: Sets 66-73 were tagging sets and are excluded from the stratified random survey
Sets 37 and 61 were unsuccessful

Table 2a. Stratified analysis estimated cod abundance and biomass.

COD GEAC 3PS 2005 No Zone
ANALYSIS FOR TRIP 10 2005 VESSEL 49 ICNAF 3P SPECIES 0438

NUMBERS

STRATUM	NO.SETS	TOTAL	AV./SET	UNITS	TOTAL NO	VAR.
310	2	85.56	42.78	9255.	395958.	77.35
311	2	7.50	3.75	17903.	67136.	28.13
312	2	55.00	27.50	16281.	447739.	924.50
313	2	63.31	31.66	11147.	352873.	1119.24
314	2	3.00	1.50	61748.	92622.	4.50
315	4	16.00	4.00	52357.	209429.	6.00
316	2	9.00	4.50	11147.	50162.	24.50
317	2	10.64	5.32	11620.	61835.	37.35
318	2	115.86	57.93	8715.	504845.	4062.87
319	6	75.65	12.61	66477.	838182.	171.00
320	5	46.00	9.20	79988.	735893.	213.20
321	6	5.89	0.98	73503.	72190.	1.52
322	7	24.00	3.43	94648.	324509.	13.95
323	4	17.00	4.25	47020.	199836.	61.58
324	2	1.00	0.50	33374.	16687.	0.50
325	5	3.88	0.77	63775.	49425.	0.63
326	2	0.00	0.00	11215.	0.	0.00
705	2	2.94	1.47	13174.	19349.	0.56
706	2	1.00	0.50	28509.	14255.	0.50
707	2	1.00	0.50	4999.	2500.	0.50
708	2	3.95	1.98	8512.	16812.	6.30
711	2	0.00	0.00	37630.	0.	0.00
712	2	1.00	0.50	49385.	24692.	0.50
713	2	0.00	0.00	57492.	0.	0.00

TOTAL	TOTAL UPPER	TOTAL LOWER	AVERAGE MEAN	AVERAGE UPPER	AVERAGE LOWER
4496929.	6520444.	2473414.	5.17	7.50	2.84

EFFECTIVE DEGREES OF FREEDOM= 10 STUDENTS T-VALUE= 2.23 ALPHA=0.05

WEIGHTS

STRATUM	NO.SETS	TOTAL	AV./SET	UNITS	TOTAL NO	VAR.
310	2	239.06	119.53	9255.	1106311.	4134.81
311	2	6.09	3.05	17903.	54548.	18.57
312	2	134.00	67.00	16281.	1090855.	32.00
313	2	120.69	60.34	11147.	672654.	2358.99
314	2	3.00	1.50	61748.	92622.	4.50
315	4	96.00	24.00	52357.	1256575.	578.00
316	2	34.50	17.25	11147.	192286.	276.13
317	2	16.57	8.29	11620.	96279.	121.23
318	2	362.86	181.43	8715.	1581142.	38404.08
319	6	193.87	32.31	66477.	2147934.	919.09
320	5	99.50	19.90	79988.	1591769.	431.80
321	6	18.01	3.00	73503.	220673.	24.93
322	7	42.00	6.00	94648.	567891.	49.92
323	4	24.00	6.00	47020.	282121.	128.67
324	2	0.40	0.20	33374.	6675.	0.08
325	5	23.67	4.73	63775.	301893.	93.40
326	2	0.00	0.00	11215.	0.	0.00
705	2	11.50	5.75	13174.	75749.	6.13
706	2	0.30	0.15	28509.	4276.	0.05
707	2	1.50	0.75	4999.	3749.	1.13
708	2	14.21	7.11	8512.	60490.	96.78
711	2	0.00	0.00	37630.	0.	0.00
712	2	3.00	1.50	49385.	74077.	4.50
713	2	0.00	0.00	57492.	0.	0.00

TOTAL	TOTAL UPPER	TOTAL LOWER	AVERAGE MEAN	AVERAGE UPPER	AVERAGE LOWER
11480571.	16418955.	6542188.	13.20	18.88	7.52

EFFECTIVE DEGREES OF FREEDOM= 5 STUDENTS T-VALUE= 2.57 ALPHA=0.05

Table 2b. Stratified analysis estimated cod abundance and biomass: comparison for 1997-2005.

3Ps Cod Estimates						
"numbers"abundance (millions of fish)						
	95% upper limit	Estimated	95% lower limit	95% upper limit	Mean #fish /tow	95% lower limit
1997	57.1	30.9	4.8	97	52.6	8.2
1998 **	11.9	10.5	9.1	14	12.6	11
1999	20.7	13.7	6.7	24.9	16.5	8.1
2000 **	61.7	37.7	13.6	74.2	45.3	16.4
2001	79.6	44.0	8.3	91.5	50.5	9.58
2002	119.2	37.9	0	138.9	44.1	0
2003	51.9	21.9	0	59.7	25.1	0
2004	13.5	6.6	0	15.5	7.6	0
2005	6.5	4.5	2.5	7.5	5.2	2.84
"weights" biomass (kt)						
	95% upper limit	Estimated	95% lower limit	95% upper limit	Mean catch /tow (kg)	95% lower limit
1997	174.2	99.3	24.4	296	169	41
1998 **	56.8	47.9	38.9	68.3	57.5	46.8
1999	61.7	44.5	27.3	74.1	53.5	32.9
2000 **	324.5	187.2	50.0	389.9	225.0	60.0
2001	142.7	82.7	22.7	164.0	95.1	26.1
2002	291.0	92.2	0	338.9	107.4	0
2003	162.5	69.7	0	186.8	80.1	0
2004	44.7	23.1	0	51.4	26.6	0
2005	16.4	11.5	6.5	18.9	13.2	7.5

** 75% upper and lower limits reported for 1998, 2000, 2003
*** Note: variance too large for valid lower limits for 2002-2004. Negative limit computed: 0 reported.

Table 3a. Stratified analysis cod age composition, numbers per standard tow.

COD GEAC 2004 3PS No Zone (S1 BY AGE) ANALYSIS FOR TRIP 10 2005 VESSEL 49 ICNAF 3P

AGE COMPOSITION-NUMBERS PER STANDARD TOW
SUMMARY TABLE SPECIES:SPECIES 0438 SEX:COMBINED

AGE IN YEARS	TOTAL NUMBERS	UPPER LIMIT	LOWER LIMIT	MEAN PER TOW	UPPER LIMIT	LOWER LIMIT	D.F.
0.0	0.	0.	0.	0.00	0.00	0.00	0
1.0	0.	0.	0.	0.00	0.00	0.00	0
2.0	43415.	124271.	-37441.	0.05	0.14	-0.04	2
3.0	1511828.	2663259.	360397.	1.74	3.06	0.41	7
4.0	999624.	1511790.	487457.	1.15	1.74	0.56	8
5.0	370075.	557616.	182533.	0.43	0.64	0.21	6
6.0	270622.	544477.	-3233.	0.31	0.63	0.00	2
7.0	641633.	1401908.	-118641.	0.74	1.61	-0.14	2
8.0	432226.	884894.	-20443.	0.50	1.02	-0.02	2
9.0	65294.	105096.	25492.	0.08	0.12	0.03	8
10.0	34847.	59256.	10439.	0.04	0.07	0.01	6
11.0	80738.	157791.	3685.	0.09	0.18	0.00	7
12.0	34670.	84894.	-15555.	0.04	0.10	-0.02	4
UNKNOWN	11958.	45155.	-21240.	0.01	0.05	-0.02	4
TOTAL	4496929.	6520444.	2473414.	5.17	7.50	2.84	10

ESTIMATION TYPE:STANDARD TRANSFORMATION TYPE:NONE CONFIDENCE LEVEL: 0.95%
****-ONE OR MORE OF THE LOWER LIMITS IN THE ABOVE TABLE IS LESS THAN OR EQUAL TO ZERO.
VARIANCE IS TOO LARGE FOR VALID CONFIDENCE LIMITS ****

Table 3b. Stratified analysis estimated cod abundance age distribution: 1997-2005.

	3Ps Cod Estimates																	
	"number" abundance (millions of fish)									Mean #fish/tow								
Age (years)	1997	1998	1999	2000	2001	2002	2003	2004	2005	1997	1998	1999	2000	2001	2002	2003	2004	2005
1		0.01			0.03						0.01			0.03				
2	0.17	0.05	0.28	1.36	0.18		0.19	0.07	0.04	0.29	0.06	0.34	1.64	0.21		0.22	0.08	0.05
3	1.93	0.33	0.95	6.03	10.85	1.08	0.36	0.59	1.51	3.28	0.40	1.14	7.24	12.47	1.26	0.41	0.68	1.74
4	5.55	1.47	1.43	2.38	23.26	14.49	2.10	0.70	1.00	9.42	1.76	1.71	2.86	26.74	16.88	2.46	0.80	1.15
5	8.02	1.93	2.35	2.79	3.27	15.86	7.30	0.93	0.37	13.62	2.32	2.83	3.35	3.75	18.47	8.34	1.07	0.43
6	1.78	1.51	2.98	4.31	1.86	2.48	8.07	2.60	0.27	3.02	1.81	3.58	5.18	2.14	2.90	9.28	2.98	0.31
7	5.91	0.29	2.73	4.90	1.41	1.19	1.15	1.02	0.64	10.03	0.35	3.27	5.89	1.62	1.39	1.32	1.18	0.74
8	7.05	1.36	0.43	3.32	1.17	1.01	0.60	0.13	0.43	11.97	1.64	0.51	3.99	1.34	1.18	0.73	0.15	0.50
9	0.79	2.83	1.19	0.95	0.84	0.78	1.15	0.11	0.07	1.34	3.40	1.43	1.14	0.96	0.91	1.32	0.12	0.08
10	0.32	0.33	1.13	4.85	0.09	0.39	0.42	0.16	0.03	0.54	0.40	1.36	5.83	0.10	0.46	0.48	0.18	0.04
11	0.14	0.04	0.14	5.94	0.38	0.07	0.21	0.11	0.08	0.24	0.04	0.17	7.14	0.44	0.09	0.24	0.13	0.09
12	0.02	0.11	0.08	0.66	0.50	0.23		0.04	0.03	0.04	0.13	0.10	0.79	0.58	0.27		0.05	0.04
13		0.18	0.01	0.09	0.07	0.26	0.14				0.22	0.02	0.11	0.08	0.30	0.16		
14				0.14	0.04		0.13	0.11					0.17	0.05		0.15	0.13	
15		0.03			0.03		0.03	0.06			0.04			0.03		0.03	0.06	
16					0.01			0.01						0.02			0.01	
Total	**31.7**	**10.5**	**13.7**	**37.7**	**44.0**	**37.8**	**21.9**	**6.6**	**4.5**	**53.8**	**12.6**	**16.5**	**45.3**	**50.6**	**44.1**	**25.1**	**7.6**	**5.2**

Table 4a. Cod abundance estimates (thousands of fish) from GEAC surveys in NAFO Subdivision 3Ps from 1997 to 2005.

Depth range (fathoms)	Strata	Vessel / Trip / #Sets / Mean Date / sq. mi.	Pennysmart 2 12-Dec 1997	Pennysmart 3 06-Dec 1998	Pennysmart 4 27-Nov 1999	Pennysmart 5 10-Dec 2000	Pennysmart 6 05-Dec 2001	Pennysmart 7 29-Nov 2002	Pennysmart 8 04-Dec 2003	Pennysmart 9 06-Dec 2004	Pennysmart 10 13-Dec 2005
<30	314	974	86	1111	138	5527	15972	152	2787	46	93
	320	1320	4004	1540	1914	2760	22386	745	1823	232	736
		Subtotal	4090	2651	2052	8287	38358	897	4610	278	829
31-50	312	272	725	33	347	554	8	73	627	225	448
	315	827	2046	1456	3158	3304	446	342	135	938	209
	321	1189	175	189	250	73	127	1481	103	119	72
	325	944	50	11	52	16	104	64	31	48	49
	326	166	17	0	5	5	16	.	0	0	0
		Subtotal	3013	1689	3812	3952	701	1960	896	1330	779
51-100	311	317	832	63	141	18	197	303	25	36	67
	317	193	226	331	126	494	30	23	861	161	62
	319	984	17410	370	833	10991	4135	33092	252	2919	838
	322	1567	.	95	253	110	105	185	92	125	325
	323	696	225	47	18	0	176	93	80	169	200
	324	494	.	78	100	125	11	81	33	89	17
		Subtotal	18693	984	1471	11738	4654	33777	1343	3499	1508
101-150	310	170	150	699	134	449	88	97	555	339	396
	313	165	443	167	1053	240	84	83	21	111	353
	316	189	3606	312	92	117	39	5	43	346	50
	318	129	339	3736	4959	12545	37	943	14142	283	505
		Subtotal	4538	4914	6238	13351	248	1128	14761	1079	1304
151-200	705	195	103	7	0	0	0	0	0	0	19
	706	476	513	29	10	19	0	54	20	69	14
	707	74	29	180	137	345	0	5	210	320	3
		Subtotal	645	216	147	364	0	59	230	389	36
201-300	708	126	.	9	17	25	0	4	17	51	17
	711	593	.	.	.	.	0	18	13	12	0
	712	731	.	0	0	0	0	0	0	0	25
	713	851	.	19	0	0	0	13	0	0	0
		Subtotal	0	28	17	25	0	35	30	63	42
	Total [1]		30,979	10,482	13,737	37,717	43,961	37,856	21,870	6,638	4,497

[1] [1]Totals are for all strata fished. Individual strata totals rounded to nearest 1000.
. denotes strata not fished

Table 4b. Cod biomass estimates (t) from GEAC surveys in NAFO Subdivision 3Ps from 1997 to 2005.

Depth range (fathoms)	Strata	Vessel Trip #Sets Mean Date sq. mi.	Pennysmart 2 84 12-Dec 1997	Pennysmart 3 86 06-Dec 1998	Pennysmart 4 90 27-Nov 1999	Pennysmart 5 73 10-Dec 2000	Pennysmart 6 91 05-Dec 2001	Pennysmart 7 75 29-Nov 2002	Pennysmart 8 89 04-Dec 2003	Pennysmart 9 86 06-Dec 2004	Pennysmart 10 71 13-Dec 2005
<30	314	974	262	7464	246	62730	25024	540	12597	77	93
	320	1320	18907	5287	5276	4813	48280	2250	7095	1853	1592
		Subtotal	19169	12751	5522	67543	73304	2790	19692	1930	1684
31-50	312	272	1215	138	775	1123	7	161	1862	754	1091
	315	827	11171	4071	10443	22405	1019	914	950	6888	1257
	321	1189	301	559	962	87	151	4246	151	610	221
	325	944	89	55	113	8	327	56	108	106	302
	326	166	36	0	2	8	7	.	0	0	0
		Subtotal	12812	4823	12295	23631	1511	5377	3071	8358	2870
51-100	311	317	1558	120	286	27	292	589	46	134	55
	317	193	957	938	336	598	164	76	2601	261	96
	319	984	48133	1255	2455	22369	6498	80311	572	7945	2148
	322	1567	.	149	345	137	174	303	185	202	568
	323	696	341	103	31	0	258	140	171	390	282
	324	494	.	174	78	66	13	104	65	122	7
		Subtotal	50989	2739	3531	23197	7399	81523	3640	9054	3155
101-150	310	170	263	1823	322	1039	170	171	1393	787	1106
	313	165	1132	458	2469	563	131	169	55	201	673
	316	189	12362	803	292	312	104	8	111	1059	192
	318	129	911	23797	19561	69788	65	2028	41165	715	1581
		Subtotal	14668	26881	22644	71702	470	2376	42724	2762	3552
151-200	705	195	277	11	0	0	0	0	0	0	76
	706	476	1317	118	33	43	0	93	69	240	4
	707	74	96	480	466	1019	0	27	415	675	4
		Subtotal	1690	609	499	1062	0	120	484	915	84
201-300	708	126	.	16	29	94	0	9	25	102	60
	711	593	.	.	.	.	0	5	25	24	0
	712	731	.	0	0	0		0	0	0	74
	713	851	.	57	0	0	0	7	0	0	0
		Subtotal	0	73	29	94	0	21	50	126	135
	Total [1]		99,328	47,876	44,520	187,229	82,684	92,207	69,661	23,145	11,481

[1] [1]Totals are for all strata fished. Individual strata totals rounded to nearest 1000.
. denotes strata not fished

Table 5. Summary of plaice catches for stratified random survey, NAFO Subdivision 3Ps, 6-18 December 2005.

M.V. Pennysmart Trip	Set	Year	Month	Day	StrLin	Division	Unit Area	Depth (m)	Set Location Lat (N)	Set Location Long (W)	PLAICE Catch # of Fish	PLAICE Catch Weight (kg)	Set Duration (min)	Tow Distance (n.mi.)	PLAICE Mean Weight (kg)
10	1	5	12	6	322	3P	M29	172	46.62	55.05	1	0.5	30	1.5	0.5
10	2	5	12	6	322	3P	M30	146	46.48	55.09	0	0	30	1.5	
10	3	5	12	6	322	3P	M30	153	46.43	55.34	0	0	30	1.5	
10	4	5	12	6	322	3P	M30	167	46.30	55.02	2	0.4	30	1.5	0.2
10	5	5	12	6	324	3P	N30	101	46.29	54.60	1	0.3	30	1.5	0.3
10	6	5	12	6	324	3P	N30	119	46.21	54.45	2	0.2	30	1.6	0.1
10	7	5	12	6	325	3P	N30	83	46.13	54.75	0	0	30	1.6	
10	8	5	12	7	323	3P	N30	144	46.09	54.84	5	4	30	1.5	0.8
10	9	5	12	7	323	3P	M30	148	46.00	55.25	4	2	30	1.5	0.5
10	10	5	12	7	322	3P	M30	126	46.25	55.66	12	5	30	1.5	0.4
10	11	5	12	7	321	3P	M30	56	46.14	55.75	11	10	30	1.4	0.9
10	12	5	12	7	321	3P	M30	80	46.24	55.86	2	1.5	30	1.5	0.8
10	13	5	12	7	322	3P	M30	129	46.31	55.76	13	5	30	1.5	0.4
10	14	5	12	7	322	3P	M30	137	46.48	55.78	0	0	30	1.5	
10	15	5	12	8	321	3P	M31	60	45.74	55.57	7	4	30	1.5	0.6
10	16	5	12	8	321	3P	M31	81	45.69	55.40	6	6	30	1.5	1.0
10	17	5	12	8	323	3P	M31	148	45.74	55.35	13	6	30	1.5	0.5
10	18	5	12	8	323	3P	M31	138	45.64	55.11	68	30	30	1.5	0.4
10	19	5	12	8	325	3P	N31	63	45.69	54.92	0	0	30	1.5	
10	20	5	12	8	325	3P	N31	69	45.85	54.79	0	0	30	1.5	
10	21	5	12	8	325	3P	N31	80	45.85	54.70	0	0	30	1.4	
10	22	5	12	8	326	3P	N31	81	45.74	54.43	0	0	30	1.5	
10	23	5	12	8	326	3P	N31	84	45.56	54.43	4	3.5	30	1.6	0.9
10	24	5	12	8	325	3P	N31	78	45.55	54.88	2	1	30	1.5	0.5
10	25	5	12	8	319	3P	N31	104	45.55	54.99	6	3	30	1.5	0.5
10	26	5	12	9	319	3P	M32	128	45.50	55.38	10	6	30	1.5	0.6
10	27	5	12	9	315	3P	M31	70	45.50	55.54	15	14	30	1.5	0.9
10	28	5	12	9	320	3P	M31	55	45.65	55.66	228	479.5	30	1.5	2.1
10	29	5	12	9	321	3P	M31	67	45.80	55.49	5	6	30	1.6	1.2
10	30	5	12	9	321	3P	M31	67	45.91	55.69	1	0.5	30	1.6	0.5
10	31	5	12	9	320	3P	L31	49	45.78	56.07	0	0	30	1.5	
10	32	5	12	9	320	3P	L31	48	45.79	56.49	0	0	30	1.5	
10	33	5	12	9	320	3P	L31	52	45.95	56.51	7	6.5	30	1.6	0.9
10	34	5	12	9	314	3P	L30	54	46.22	56.69	7	7	30	1.5	1.0
10	35	5	12	10	312	3P	L30	63	46.20	56.76	196	180	30	1.5	0.9
10	36	5	12	10	314	3P	K30	47	46.29	57.01	25	30	30	1.5	1.2
10	38	5	12	13	312	3P	K29	77	46.74	57.03	9	5	30	1.5	0.6
10	39	5	12	13	311	3P	K29	100	46.81	57.04	10	5	30	1.6	0.5
10	40	5	12	13	310	3P	K29	219	46.81	57.30	2	1	30	1.6	0.5
10	41	5	12	13	310	3P	K29	243	46.77	57.37	2	1.5	30	1.5	0.8
10	42	5	12	13	313	3P	K29	262	46.63	57.50	1	1	30	1.6	1.0
10	43	5	12	13	313	3P	K29	206	46.50	57.44	16	14	30	1.5	0.9
10	44	5	12	14	311	3P	K30	136	46.25	57.19	72	71	30	1.5	1.0
10	45	5	12	14	705	3P	K30	340	46.12	57.28	12	11	30	1.5	0.9
10	46	5	12	14	705	3P	K30	321	46.07	57.18	21	25	30	1.6	1.2
10	47	5	12	14	706	3P	L31	356	45.80	56.93	13	14	30	1.6	1.1
10	48	5	12	14	317	3P	L31	125	45.69	56.63	1034	1211.98	30	1.5	1.2
10	49	5	12	14	316	3P	L31	231	45.61	56.60	2	1	30	1.5	0.5
10	50	5	12	14	316	3P	L31	203	45.56	56.55	11	13	30	1.5	1.2
10	51	5	12	14	706	3P	L32	353	45.30	56.49	9	6	30	1.5	0.7
10	52	5	12	14	315	3P	L32	77	45.20	56.10	7	4.5	30	1.5	0.6
10	53	5	12	15	320	3P	M32	46	45.43	55.93	18	13	30	1.5	0.7
10	54	5	12	15	315	3P	M32	76	45.22	55.78	105	76	30	1.5	0.7
10	55	5	12	15	315	3P	M32	79	45.05	55.80	59	47	30	1.5	0.8
10	56	5	12	15	317	3P	M33	127	44.95	55.94	953	623.83	30	1.4	0.7
10	57	5	12	15	318	3P	M33	208	44.91	55.92	15	9	30	1.4	0.6
10	58	5	12	15	319	3P	M32	114	45.02	55.59	891	865.7	30	1.4	1.0
10	59	5	12	15	707	3P	M33	323	44.99	55.53	5	2	30	1.5	0.4
10	60	5	12	15	318	3P	M32	245	45.03	55.37	0	0	30	1.5	
10	62	5	12	16	707	3P	N32	338	45.06	54.76	20	14	30	1.5	0.7
10	63	5	12	16	319	3P	N32	101	45.15	54.78	15	8	30	1.5	0.5
10	64	5	12	16	319	3P	M32	155	45.37	55.15	39	20	30	1.6	0.5
10	65	5	12	16	319	3P	M32	168	45.31	55.36	350	175	30	1.4	0.5
10	74	5	12	17	708	3P	M33	425	45.00	55.49	5	7	30	1.6	1.4
10	75	5	12	17	708	3P	M33	506	44.91	55.59	11	9	30	1.5	0.8
10	76	5	12	17	711	3P	L32	390	45.14	56.51	9	9	30	1.5	1.0
10	77	5	12	17	711	3P	L32	392	45.39	56.75	3	4	30	1.6	1.3
10	78	5	12	18	712	3P	L31	410	45.60	56.96	5	5	30	1.6	1.0
10	79	5	12	18	712	3P	K31	411	45.88	57.10	4	4.5	30	1.5	1.1
10	80	5	12	18	713	3P	K31	486	45.98	57.62	0	0	30	1.5	
10	81	5	12	18	713	3P	K30	456	46.17	57.60	0	0	30	1.6	
									Minimum		0.0	0.0	30.0	1.4	0.1
									Maximum		1034.0	1212.0	30.0	1.6	2.1
									Mean		61.7	57.6	30.0	1.5	0.9
									Median		7.0	5.0	30.0	1.5	0.7
									Standard Error		2.8	2.8	0.0	0.0	0.0
									Total		4381.0	4088.9			

Notes: Sets 66-73 were tagging sets and are excluded from the stratified random survey
Sets 37 and 61 were unsuccessful

Table 6a. Stratified analysis estimated plaice abundance and biomass.

PLAICE GEAC 3PS 2005 No Zone
ANALYSIS FOR TRIP 10 2005 VESSEL 49 ICNAF 3P SPECIES 0889

NUMBERS

STRATUM	NO.SETS	TOTAL	AV./SET	UNITS	TOTAL NO	VAR.
310	2	3.88	1.94	9255.	17932.	0.01
311	2	81.38	40.69	17903.	728421.	1960.95
312	2	205.00	102.50	16281.	1668846.	17484.50
313	2	16.94	8.47	11147.	94401.	113.44
314	2	32.00	16.00	61748.	987965.	162.00
315	4	186.00	46.50	52357.	2434614.	2043.67
316	2	13.00	6.50	11147.	72456.	40.50
317	2	2055.07	1027.54	11620.	11939901.	83.57
318	2	16.07	8.04	8715.	70031.	129.15
319	6	1397.21	232.87	66477.	15480303.	145660.42
320	5	252.56	50.51	79988.	4040415.	9898.38
321	6	32.41	5.40	73503.	397047.	15.14
322	7	28.00	4.00	94648.	378594.	34.33
323	4	90.00	22.50	47020.	1057955.	936.33
324	2	2.88	1.44	33374.	47974.	0.38
325	5	2.00	0.40	63775.	25510.	0.80
326	2	3.75	1.88	11215.	21027.	7.03
705	2	31.69	15.84	13174.	208722.	29.55
706	2	21.19	10.59	28509.	302021.	5.08
707	2	25.00	12.50	4999.	62491.	112.50
708	2	15.69	7.84	8512.	66768.	19.92
711	2	11.81	5.91	37630.	222250.	19.14
712	2	8.69	4.34	49385.	214515.	0.24
713	2	0.00	0.00	57492.	0.	0.00

	TOTAL	TOTAL UPPER	TOTAL LOWER	AVERAGE MEAN	AVERAGE UPPER	AVERAGE LOWER
	40540164.	67885640.	13194685.	46.60	78.04	15.17

EFFECTIVE DEGREES OF FREEDOM= 6 STUDENTS T-VALUE= 2.45 ALPHA=0.05

WEIGHTS

STRATUM	NO.SETS	TOTAL	AV./SET	UNITS	TOTAL NO	VAR.
310	2	2.44	1.22	9255.	11280.	0.16
311	2	75.69	37.84	17903.	677510.	2198.67
312	2	185.00	92.50	16281.	1506032.	15312.50
313	2	14.94	7.47	11147.	83254.	85.31
314	2	37.00	18.50	61748.	1142335.	264.50
315	4	141.50	35.38	52357.	1852139.	1065.23
316	2	14.00	7.00	11147.	78029.	72.00
317	2	1880.37	940.18	11620.	10924887.	147745.42
318	2	9.64	4.82	8715.	42019.	46.49
319	6	1150.79	191.80	66477.	12750102.	135044.27
320	5	498.59	99.72	79988.	7976344.	45101.81
321	6	28.31	4.72	73503.	346787.	13.47
322	7	10.90	1.56	94648.	147381.	5.57
323	4	42.00	10.50	47020.	493712.	171.67
324	2	0.49	0.24	33374.	8135.	0.01
325	5	1.00	0.20	63775.	12755.	0.20
326	2	3.28	1.64	11215.	18399.	5.38
705	2	34.44	17.22	13174.	226836.	77.35
706	2	19.13	9.56	28509.	272621.	25.38
707	2	16.00	8.00	4999.	39994.	72.00
708	2	15.56	7.78	8512.	66236.	2.97
711	2	12.75	6.38	37630.	239889.	13.78
712	2	9.19	4.59	49385.	226861.	0.02
713	2	0.00	0.00	57492.	0.	0.00

	TOTAL	TOTAL UPPER	TOTAL LOWER	AVERAGE MEAN	AVERAGE UPPER	AVERAGE LOWER
	39143540.	68272904.	10014175.	45.00	78.49	11.51

EFFECTIVE DEGREES OF FREEDOM= 10 STUDENTS T-VALUE= 2.23 ALPHA=0.05

Table 6b. Stratified analysis estimated plaice abundance and biomass: comparison for 1998-2005.

3Ps Plaice Estimates						
"Numbers" Abundance (millions of fish)						
	95% upper limit	Estimated	95% lower limit	95% upper limit	Mean #fish /tow	95% lower limit
1998	17.4	12.7	8.0	20.9	15.3	9.6
1999	85.4	44.1	2.7	102.6	52.9	3.3
2000	84.1	47.6	11.2	101.0	57.3	13.5
2001	113.8	59.3	4.8	130.8	68.2	5.5
2002	141.3	26.0	0	164.5	30.3	0
2003	42.4	25.6	8.8	48.8	29.5	10.1
2004	34.5	23.1	11.8	39.6	26.6	13.6
2005	67.9	40.5	13.2	78.0	46.6	15.2
"Weights" Biomass (kt)						
	95% upper limit	Estimated	95% lower limit	95% upper limit	Mean catch /tow (kg)	95% lower limit
1998	13.9	9.2	4.5	16.7	11.1	5.4
1999	57.8	28.7	0	69.4	34.5	0
2000	53.6	32.7	11.9	64.4	39.3	14.3
2001	69.7	36.4	3.1	80.2	41.9	3.6
2002	92.1	18.6	0	107.2	21.7	0
2003	42.1	25.2	8.3	48.4	28.9	9.52
2004	28.4	18.8	9.2	32.7	21.6	10.6
2005	68.3	39.1	10.0	78.5	45.0	11.5
Note: Variance too large for valid lower limits for 1999 and 2002 biomass. Negative limit computed. Value of 0. reported.						

Table 7a. Stratified analysis plaice age composition, numbers per standard tow.

PLAICE GEAC 2005 3PS No Zone (S1 BY AGE) ANALYSIS FOR TRIP 10 2005 VESSEL 49 ICNAF 3P
AGE COMPOSITION-NUMBERS PER STANDARD TOW
SUMMARY TABLE SPECIES:SPECIES 0889 SEX:COMBINED

AGE IN YEARS	TOTAL NUMBERS	UPPER LIMIT	LOWER LIMIT	MEAN PER TOW	UPPER LIMIT	LOWER LIMIT	D.F.
0 to 3	0.	0.	0.	0.00	0.00	0.00	0
4.0	55264.	498789.	-388261.	0.06	0.57	-0.45	1
5.0	238921.	338718.	139125.	0.27	0.39	0.16	10
6.0	1444978.	2237358.	652598.	1.66	2.57	0.75	7
7.0	5934338.	9749746.	2118928.	6.82	11.21	2.44	6
8.0	6183388.	10774528.	1592247.	7.11	12.39	1.83	5
9.0	5232731.	9310102.	1155359.	6.02	10.70	1.33	5
10.0	6238160.	10800690.	1675629.	7.17	12.42	1.93	5
11.0	3828073.	6461545.	1194602.	4.40	7.43	1.37	6
12.0	2402378.	4441017.	363738.	2.76	5.11	0.42	6
13.0	2375816.	4621181.	130451.	2.73	5.31	0.15	7
14.0	2463216.	4852996.	73436.	2.83	5.58	0.08	9
15.0	1962321.	4009791.	-85149.	2.26	4.61	-0.10	8
16.0	1187525.	2745263.	-370214.	1.37	3.16	-0.43	5
17.0	790321.	1809888.	-229245.	0.91	2.08	-0.26	5
18.0	163685.	383400.	-56029.	0.19	0.44	-0.06	5
19.0	31270.	86763.	-24222.	0.04	0.10	-0.03	5
UNKNOWN	15998.	60411.	-28416.	0.02	0.07	-0.03	4
TOTAL	40548380.	67906088.	13190680.	46.61	78.06	15.16	6

ESTIMATION TYPE:STANDARD TRANSFORMATION TYPE:NONE CONFIDENCE LEVEL: 0.95%
****-ONE OR MORE OF THE LOWER LIMITS IN THE ABOVE TABLE IS LESS THAN OR EQUAL TO ZERO.
VARIANCE IS TOO LARGE FOR VALID CONFIDENCE LIMITS ****

Table 7b. Stratified analysis estimated plaice abundance age distribution: 1998-2005.

	3Ps Plaice Estimates															
	"number" abundance (millions of fish)								Mean #fish/tow							
Age (years)	1998	1999	2000	2001	2002	2003	2004	2005	1998	1999	2000	2001	2002	2003	2004	2005
3		0.01	0.01	0.08	0.02		0.02			0.01	0.02	0.09	0.02		0.02	
4	0.03		0.01	0.03	0.39	0.18	0.01	0.06	0.03		0.02	0.03	0.45	0.21	0.01	0.06
5	0.10	0.23	0.09	0.29	0.56	0.78	0.38	0.24	0.12	0.27	0.11	0.33	0.66	0.89	0.43	0.27
6	0.26	1.23	1.34	1.04	0.86	1.37	2.05	1.44	0.31	1.48	1.61	1.19	1.01	1.57	2.35	1.66
7	0.60	3.09	5.42	9.48	2.04	1.61	3.22	5.93	0.72	3.72	6.52	10.90	2.37	1.85	3.71	6.82
8	1.62	7.67	9.48	14.66	5.33	2.90	2.62	6.18	1.94	9.21	11.39	16.86	6.21	3.34	3.02	7.11
9	2.11	14.52	11.85	13.69	5.27	4.90	2.52	5.23	2.53	17.45	14.24	15.74	6.14	5.63	2.89	6.02
10	2.77	9.96	7.34	8.68	4.83	3.90	3.97	6.24	3.33	11.97	8.82	9.97	5.62	4.49	4.56	7.17
11	1.64	3.68	3.19	6.26	2.06	2.35	2.81	3.83	1.97	4.43	3.83	7.20	2.40	2.70	3.23	4.40
12	1.73	2.20	2.71	3.08	1.66	2.07	2.18	2.40	2.08	2.64	3.26	3.54	1.93	2.38	2.51	2.76
13	0.91	0.89	1.39	1.05	1.42	1.98	1.37	2.38	1.09	1.07	1.67	1.21	1.65	2.28	1.57	2.73
14	0.40	0.43	0.49	0.47	0.74	1.67	0.84	2.46	0.49	0.52	0.59	0.55	0.87	1.92	0.97	2.83
15	0.31	0.07	0.37	0.26	0.49	1.19	0.64	1.96	0.37	0.08	0.45	0.30	0.57	1.37	0.74	2.26
16	0.12	0.03	0.05	0.08	0.24	0.57	0.36	1.19	0.15	0.04	0.06	0.09	0.28	0.66	0.42	1.37
17	0.02	0.03	0.07	0.08	0.08	0.14	0.09	0.79	0.03	0.04	0.08	0.09	0.10	0.17	0.10	0.91
18	0.08		0.04	0.01	0.03	0.02	0.05	0.16	0.10		0.05	0.01	0.03	0.02	0.05	0.19
19							0.01	0.03							0.01	0.04
Total	**12.7**	**44.0**	**43.9**	**59.2**	**26.0**	**25.6**	**23.1**	**40.5**	**15.3**	**52.9**	**52.7**	**68.1**	**30.3**	**29.5**	**26.6**	**46.6**

Table 8a. Plaice abundance estimates (thousands of fish) from GEAC surveys in NAFO Subdivision 3Ps from 1998 to 2005.

Depth range (fathoms)	Strata	Vessel Trip #Sets Mean Date sq. mi.	Pennysmart 3 86 06-Dec 1998	Pennysmart 4 90 27-Nov 1999	Pennysmart 5 73 10-Dec 2000	Pennysmart 6 91 05-Dec 2001	Pennysmart 7 75 29-Nov 2002	Pennysmart 8 89 04-Dec 2003	Pennysmart 9 86 06-Dec 2004	Pennysmart 10 71 13-Dec 2005
<30	314	974	198	190	3816	154	707	2644	421	988
	320	1320	3020	1147	800	930	687	4593	3637	4040
		Subtotal	3218	1337	4616	1084	1394	7237	4058	5028
31-50	312	272	147	779	33	269	0	154	483	1669
	315	827	2838	5015	9945	15154	4918	6904	4472	2435
	321	1189	210	2034	206	209	567	659	371	397
	325	944	53	144	16	83	188	10	103	26
	326	166	0	37	0	5	-	6	0	21
		Subtotal	3248	8009	10200	15720	5673	7733	5429	4548
51-100	311	317	63	2202	528	6338	9116	2089	1674	728
	317	193	1482	1349	1278	862	1807	2336	6303	11940
	319	984	1947	28370	29471	32748	5477	5016	3702	15480
	322	1567	414	740	363	294	406	169	777	379
	323	696	263	906	436	881	835	219	222	1058
	324	494	11	67	141	200	47	110	122	48
		Subtotal	4180	33634	32217	41323	17688	9939	12800	29633
101-150	310	170	440	148	143	9	9	42	93	18
	313	165	418	72	100	184	314	26	78	94
	316	189	50	153	100	256	21	102	33	72
	318	129	84	17	0	289	173	122	83	70
		Subtotal	992	390	343	738	517	292	287	254
151-200	705	195	224	198	71	86	216	125	144	209
	706	476	475	295	151	152	332	125	273	302
	707	74	117	19	5	55	12	35	3	62
		Subtotal	816	512	227	293	560	285	420	573
201-300	708	126	21	4	16	89	26	63	4	67
	711	593	-	-	-	19	56	12	59	222
	712	731	16	85	0	12	66	23	0	215
	713	851	211	89	23	11	42	54	84	0
		Subtotal	248	178	39	131	190	152	147	504
	Total [1]		12,702	44,060	47,642	59,289	26,022	25,638	23,141	40,540

[1] Totals are for all strata fished. Individual strata totals rounded to nearest 1000.

Table 8b. Plaice biomass estimates (t) from GEAC surveys in NAFO Subdivision 3Ps from 1998 to 2005.

Depth range (fathoms)	Strata	Vessel / Trip / #Sets / Mean Date / sq. mi.	Pennysmart 3 06-Dec 1998	Pennysmart 4 27-Nov 1999	Pennysmart 5 10-Dec 2000	Pennysmart 6 05-Dec 2001	Pennysmart 7 29-Nov 2002	Pennysmart 8 04-Dec 2003	Pennysmart 9 06-Dec 2004	Pennysmart 10 13-Dec 2005
			86	90	73	91	75	89	86	71
<30	314	974	116	238	4025	188	795	2911	322	1142
	320	1320	3030	997	820	1347	885	7475	3895	7976
		Subtotal	3146	1235	4845	1535	1680	10386	4217	9118
31-50	312	272	163	603	41	211	0	125	288	1506
	315	827	1671	3652	8784	8273	3866	6352	3480	1852
	321	1189	176	1198	132	172	679	692	265	347
	325	944	41	84	6	43	105	3	77	13
	326	166	0	14	0	2	-	3	0	18
		Subtotal	2051	5551	8963	8701	4650	7175	4110	3736
51-100	311	317	43	1016	349	3676	5653	1601	1343	678
	317	193	1076	824	1084	594	1545	2172	5861	10925
	319	984	940	18769	16567	20391	3255	2934	1960	12750
	322	1567	131	202	118	107	175	78	351	147
	323	696	67	268	166	385	370	145	110	494
	324	494	11	27	26	65	23	16	67	8
		Subtotal	2268	21106	18310	25218	11021	6946	9692	25002
101-150	310	170	273	99	72	5	16	31	60	11
	313	165	344	39	56	114	225	20	67	83
	316	189	32	139	100	291	29	145	42	78
	318	129	78	13	0	178	114	65	61	42
		Subtotal	727	290	228	588	384	261	230	214
151-200	705	195	144	138	109	66	195	124	157	227
	706	476	635	238	237	196	436	132	290	273
	707	74	60	11	2	36	12	16	1	40
		Subtotal	839	387	348	298	643	272	448	540
201-300	708	126	9	2	13	66	29	27	13	66
	711	593	-	-	-	13	75	12	47	240
	712	731	3	44	0	4	66	29	0	227
	713	851	161	65	34	5	56	61	55	0
		Subtotal	173	111	47	88	226	129	115	533
	Total [1]		9,204	28,680	32,741	36,428	18,604	25,169	18,812	39,143

[1] Totals are for all strata fished. Individual strata totals rounded to nearest 1000.

Table 9. Summary of witch catches for stratified random survey, NAFO Subdivision 3Ps, 6-18 December 2005.

M.V. Pennysmart									Set Location		WITCH Catch	WITCH Catch	Set Duration	Tow Distance	WITCH Mean
Trip	Set	Year	Month	Day	StrLin	Division	Unit Area	Depth (m)	Lat (N)	Long (W)	# of Fish	Weight (kg)	(min)	(n.mi.)	Weight (kg)
10	1	5	12	6	322	3P	M29	172	46.62	55.05	0	0	30	1.5	
10	2	5	12	6	322	3P	M30	146	46.48	55.09	0	0	30	1.5	
10	3	5	12	6	322	3P	M30	153	46.43	55.34	0	0	30	1.5	
10	4	5	12	6	322	3P	M30	167	46.30	55.02	0	0	30	1.5	
10	5	5	12	6	324	3P	N30	101	46.29	54.60	0	0	30	1.5	
10	6	5	12	6	324	3P	N30	119	46.21	54.45	0	0	30	1.6	
10	7	5	12	6	325	3P	N30	83	46.13	54.75	0	0	30	1.6	
10	8	5	12	7	323	3P	N30	144	46.09	54.84	0	0	30	1.5	
10	9	5	12	7	323	3P	M30	148	46.00	55.25	0	0	30	1.5	
10	10	5	12	7	322	3P	M30	126	46.25	55.66	0	0	30	1.5	
10	11	5	12	7	321	3P	M30	56	46.14	55.75	0	0	30	1.4	
10	12	5	12	7	321	3P	M30	80	46.24	55.86	0	0	30	1.5	
10	13	5	12	7	322	3P	M30	129	46.31	55.76	0	0	30	1.5	
10	14	5	12	7	322	3P	M30	137	46.48	55.78	0	0	30	1.5	
10	15	5	12	8	321	3P	M31	60	45.74	55.57	0	0	30	1.5	
10	16	5	12	8	321	3P	M31	81	45.69	55.40	0	0	30	1.5	
10	17	5	12	8	323	3P	M31	148	45.74	55.35	0	0	30	1.5	
10	18	5	12	8	323	3P	M31	138	45.64	55.11	1	1	30	1.5	1.0
10	19	5	12	8	325	3P	N31	63	45.69	54.92	0	0	30	1.5	
10	20	5	12	8	325	3P	N31	69	45.85	54.79	0	0	30	1.5	
10	21	5	12	8	325	3P	N31	80	45.85	54.70	0	0	30	1.4	
10	22	5	12	8	326	3P	N31	81	45.74	54.43	0	0	30	1.5	
10	23	5	12	8	326	3P	N31	84	45.56	54.43	0	0	30	1.6	
10	24	5	12	8	325	3P	N31	78	45.55	54.88	0	0	30	1.5	
10	25	5	12	8	319	3P	N31	104	45.55	54.99	0	0	30	1.5	
10	26	5	12	9	319	3P	M32	128	45.50	55.38	0	0	30	1.5	
10	27	5	12	9	315	3P	M31	70	45.50	55.54	0	0	30	1.5	
10	28	5	12	9	320	3P	M31	55	45.65	55.66	0	0	30	1.5	
10	29	5	12	9	321	3P	M31	67	45.80	55.49	0	0	30	1.6	
10	30	5	12	9	321	3P	M31	67	45.91	55.69	0	0	30	1.6	
10	31	5	12	9	320	3P	L31	49	45.78	56.07	0	0	30	1.5	
10	32	5	12	9	320	3P	L31	48	45.79	56.49	0	0	30	1.5	
10	33	5	12	9	320	3P	L31	52	45.95	56.51	0	0	30	1.6	
10	34	5	12	9	314	3P	L30	54	46.22	56.69	0	0	30	1.5	
10	35	5	12	10	312	3P	L30	63	46.20	56.76	0	0	30	1.5	
10	36	5	12	10	314	3P	K30	47	46.29	57.01	0	0	30	1.5	
10	38	5	12	13	312	3P	K29	77	46.74	57.03	0	0	30	1.5	
10	39	5	12	13	311	3P	K29	100	46.81	57.04	0	0	30	1.6	
10	40	5	12	13	310	3P	K29	219	46.81	57.30	2	1	30	1.6	0.5
10	41	5	12	13	310	3P	K29	243	46.77	57.37	5	2	30	1.5	0.4
10	42	5	12	13	313	3P	K29	262	46.63	57.50	5	2	30	1.6	0.4
10	43	5	12	13	313	3P	K29	206	46.50	57.44	28	12	30	1.5	0.4
10	44	5	12	14	311	3P	K30	136	46.25	57.19	61	20	30	1.5	0.3
10	45	5	12	14	705	3P	K30	340	46.12	57.28	23	7	30	1.5	0.3
10	46	5	12	14	705	3P	K30	321	46.07	57.18	17	7	30	1.6	0.4
10	47	5	12	14	706	3P	L31	356	45.80	56.93	12	4.5	30	1.6	0.4
10	48	5	12	14	317	3P	L31	125	45.69	56.63	56	18	30	1.5	0.3
10	49	5	12	14	316	3P	L31	231	45.61	56.60	19	8	30	1.5	0.4
10	50	5	12	14	316	3P	L31	203	45.56	56.55	42	14	30	1.5	0.3
10	51	5	12	14	706	3P	L32	353	45.30	56.49	15	5	30	1.5	0.3
10	52	5	12	14	315	3P	L32	77	45.20	56.10	0	0	30	1.5	
10	53	5	12	15	320	3P	M32	46	45.43	55.93	0	0	30	1.5	
10	54	5	12	15	315	3P	M32	76	45.22	55.78	0	0	30	1.5	
10	55	5	12	15	315	3P	M32	79	45.05	55.80	0	0	30	1.5	
10	56	5	12	15	317	3P	M33	127	44.95	55.94	0	0	30	1.4	
10	57	5	12	15	318	3P	M33	208	44.91	55.92	159	77	30	1.4	0.5
10	58	5	12	15	319	3P	M32	114	45.02	55.59	0	0	30	1.4	
10	59	5	12	15	707	3P	M33	323	44.99	55.53	33	17	30	1.5	0.5
10	60	5	12	15	318	3P	M32	245	45.03	55.37	0	0	30	1.5	
10	62	5	12	16	707	3P	N32	338	45.06	54.76	58	25	30	1.5	0.4
10	63	5	12	16	319	3P	N32	101	45.15	54.78	4	4	30	1.5	1.0
10	64	5	12	16	319	3P	M32	155	45.37	55.15	53	29	30	1.6	0.5
10	65	5	12	16	319	3P	M32	168	45.31	55.36	77	33	30	1.4	0.4
10	74	5	12	17	708	3P	M33	425	45.00	55.49	4	3	30	1.6	0.8
10	75	5	12	17	708	3P	M33	506	44.91	55.59	11	5	30	1.5	0.5
10	76	5	12	17	711	3P	L32	390	45.14	56.51	5	2	30	1.5	0.4
10	77	5	12	17	711	3P	L32	392	45.39	56.75	6	2	30	1.6	0.3
10	78	5	12	18	712	3P	L31	410	45.60	56.96	10	4	30	1.6	0.4
10	79	5	12	18	712	3P	K31	411	45.88	57.10	5	1	30	1.5	0.2
10	80	5	12	18	713	3P	K31	486	45.98	57.62	7	2.5	30	1.5	0.4
10	81	5	12	18	713	3P	K30	456	46.17	57.60	0	0	30	1.6	
									Minimum		0.0	0.0	30.0	1.4	0.2
									Maximum		159.0	77.0	30.0	1.6	1.0
									Mean		10.1	4.3	30.0	1.5	0.4
									Median		0.0	0.0	30.0	1.5	0.4
									Standard Error		0.3	0.2	0.0	0.0	0.0
									Total		718.0	306.0			

Notes: Sets 66-73 were tagging sets and are excluded from the stratified random survey
Sets 37 and 61 were unsuccessful

Table 10a. Stratified analysis estimated witch abundance and biomass.

WITCH GEAC 3PS 2005 No Zone
ANALYSIS FOR TRIP 10 2005 VESSEL 49 ICNAF 3P SPECIES 0890

NUMBERS

STRATUM	NO.SETS	TOTAL	AV./SET	UNITS	TOTAL NO	VAR.
310	2	6.88	3.44	9255.	31815.	4.88
311	2	61.00	30.50	17903.	546036.	1860.50
312	2	0.00	0.00	16281.	0.	0.00
313	2	32.69	16.34	11147.	182184.	271.74
314	2	0.00	0.00	61748.	0.	0.00
315	4	0.00	0.00	52357.	0.	0.00
316	2	61.00	30.50	11147.	339985.	264.50
317	2	56.00	28.00	11620.	325358.	1568.00
318	2	170.36	85.18	8715.	742327.	14510.78
319	6	136.19	22.70	66477.	1508886.	1239.99
320	5	0.00	0.00	79988.	0.	0.00
321	6	0.00	0.00	73503.	0.	0.00
322	7	0.00	0.00	94648.	0.	0.00
323	4	1.00	0.25	47020.	11755.	0.25
324	2	0.00	0.00	33374.	0.	0.00
325	5	0.00	0.00	63775.	0.	0.00
326	2	0.00	0.00	11215.	0.	0.00
705	2	38.94	19.47	13174.	256477.	24.94
706	2	26.25	13.13	28509.	374186.	7.03
707	2	91.00	45.50	4999.	227467.	312.50
708	2	14.75	7.38	8512.	62778.	26.28
711	2	10.63	5.31	37630.	199908.	0.20
712	2	14.38	7.19	49385.	354953.	9.57
713	2	7.00	3.50	57492.	201221.	24.50

	TOTAL	TOTAL UPPER	LOWER	AVERAGE MEAN	AVERAGE UPPER	AVERAGE LOWER
	5365336.	8794370.	1936302.	6.17	10.11	2.23

EFFECTIVE DEGREES OF FREEDOM= 6 STUDENTS T-VALUE= 2.45 ALPHA=0.05

WEIGHTS

STRATUM	NO.SETS	TOTAL	AV./SET	UNITS	TOTAL NO	VAR.
310	2	2.94	1.47	9255.	13594.	0.56
311	2	20.00	10.00	17903.	179028.	200.00
312	2	0.00	0.00	16281.	0.	0.00
313	2	13.88	6.94	11147.	77333.	51.26
314	2	0.00	0.00	61748.	0.	0.00
315	4	0.00	0.00	52357.	0.	0.00
316	2	22.00	11.00	11147.	122617.	18.00
317	2	18.00	9.00	11620.	104579.	162.00
318	2	82.50	41.25	8715.	359492.	3403.13
319	6	66.54	11.09	66477.	737280.	253.45
320	5	0.00	0.00	79988.	0.	0.00
321	6	0.00	0.00	73503.	0.	0.00
322	7	0.00	0.00	94648.	0.	0.00
323	4	1.00	0.25	47020.	11755.	0.25
324	2	0.00	0.00	33374.	0.	0.00
325	5	0.00	0.00	63775.	0.	0.00
326	2	0.00	0.00	11215.	0.	0.00
705	2	13.56	6.78	13174.	89335.	0.10
706	2	9.22	4.61	28509.	131410.	0.31
707	2	42.00	21.00	4999.	104985.	3[illegible].00
708	2	7.81	3.91	8512.	33251.	2.39
711	2	3.88	1.94	37630.	72908.	0.01
712	2	4.75	2.38	49385.	117289.	3.78
713	2	2.50	1.25	57492.	71865.	3.13

	TOTAL	TOTAL UPPER	LOWER	AVERAGE MEAN	AVERAGE UPPER	AVERAGE LOWER
	2226720.	3798035.	655405.	2.56	4.37	0.75

EFFECTIVE DEGREES OF FREEDOM= 5 STUDENTS T-VALUE= 2.57 ALPHA=0.05

Table 10b. Stratified analysis estimated witch abundance and biomass: comparison for 1998-2005.

3Ps Witch Estimates						
"numbers"abundance (millions of fish)						
	95% upper limit	Estimated	95% lower limit	95% upper limit	Mean #fish /tow	95% lower limit
1998	7.20	4.65	2.10	8.7	5.6	2.5
1999	46.48	23.70	0.92	55.9	28.5	1.1
2000	18.58	6.33	0	22.3	7.6	0
2001	14.47	7.87	1.28	16.6	9.1	1.5
2002	24.05	4.83	0	28.0	5.6	0
2003	17.1	7.1	0	19.7	8.1	0
2004	8.5	5.0	1.6	9.8	5.8	1.8
2005	8.8	5.4	1.9	10.1	6.2	2.2
"weights" biomass (kt)						
	95% upper limit	Estimated	95% lower limit	95% upper limit	Mean catch /tow (kg)	95% lower limit
1998	3.07	1.80	0.53	3.7	2.2	0.6
1999	19.11	9.60	0.95	23.0	11.5	0.1
2000	8.76	2.95	0	10.5	3.6	0
2001	6.61	3.60	0.59	7.6	4.1	0.7
2002	10.86	2.16	0	12.7	2.5	0
2003	7.2	2.99	0	8.3	3.4	0
2004	11.1	2.63	0	12.7	3.0	0
2005	3.8	2.23	0.66	4.4	2.6	0.8
Note: variance too large for valid lower limits for 2000, 2002-4. Negative limit computed. Value of 0 reported.						

Table 11a. Stratified analysis witch age composition, numbers per standard tow.

WITCH GEAC 2005 3PS No Zone (S1 BY AGE)
ANALYSIS FOR TRIP 10 2005 VESSEL 49 ICNAF 3P

AGE COMPOSITION-NUMBERS PER STANDARD TOW

SUMMARY TABLE
SPECIES:SPECIES 0890
SEX:COMBINED

AGE IN YEARS	TOTAL NUMBERS	UPPER LIMIT	LOWER LIMIT	MEAN PER TOW	UPPER LIMIT	LOWER LIMIT	D.F.
0 to 4	0.	0.	0.	0.00	0.00	0.00	0
5.0	65906.	189142.	-57330.	0.08	0.22	-0.07	2
6.0	442200.	973486.	-89086.	0.51	1.12	-0.10	2
7.0	923436.	1917854.	-70983.	1.06	2.20	-0.08	2
8.0	1200894.	1874272.	527515.	1.38	2.15	0.61	9
9.0	1337992.	2492359.	183625.	1.54	2.87	0.21	4
10.0	808326.	1591466.	25186.	0.93	1.83	0.03	5
11.0	366230.	670960.	61500.	0.42	0.77	0.07	6
12.0	162560.	366525.	-41406.	0.19	0.42	-0.05	4
13.0	46680.	122079.	-28718.	0.05	0.14	-0.03	6
14.0	11112.	30807.	-8583.	0.01	0.04	-0.01	4
UNKNOWN	0.	0.	0.	0.00	0.00	0.00	0
TOTAL	5365336.	8794370.	1936302.	6.17	10.11	2.23	6

ESTIMATION TYPE:STANDARD TRANSFORMATION TYPE:NONE CONFIDENCE LEVEL: 0.95%
****-ONE OR MORE OF THE LOWER LIMITS IN THE ABOVE TABLE IS LESS THAN OR EQUAL TO ZERO.
VARIANCE IS TOO LARGE FOR VALID CONFIDENCE LIMITS ****

Table 11b. Stratified analysis estimated witch abundance age distribution: 1998-2005.

	3Ps Witch Estimates															
	"number" abundance (millions of fish)								Mean #fish/tow							
Age (years)	1998	1999	2000	2001	2002	2003	2004	2005	1998	1999	2000	2001	2002	2003	2004	2005
5	0.09	0.06	0.02	0.13	0.08	0.10	0.05	0.07	0.11	0.07	0.03	0.15	0.09	0.11	0.06	0.08
6	0.09	0.50	0.08	0.32	0.26	0.24	0.31	0.44	0.10	0.60	0.10	0.37	0.30	0.27	0.36	0.51
7	0.47	2.21	0.41	0.72	0.68	0.79	0.71	0.92	0.57	2.65	0.50	0.83	0.80	0.91	0.82	1.06
8	1.05	6.00	1.10	1.43	0.95	1.55	1.11	1.20	1.27	7.21	1.32	1.64	1.11	1.79	1.28	1.38
9	1.61	6.79	2.30	2.44	1.32	2.32	1.19	1.34	1.93	8.16	2.76	2.80	1.53	2.67	1.36	1.54
10	0.83	5.13	1.62	1.72	1.02	1.31	0.80	0.81	1.00	6.16	1.95	1.98	1.19	1.51	0.92	0.93
11	0.39	1.97	0.48	0.79	0.35	0.46	0.48	0.37	0.46	2.36	0.58	0.90	0.41	0.53	0.56	0.42
12	0.09	0.74	0.22	0.27	0.13	0.20	0.25	0.16	0.11	0.88	0.27	0.31	0.15	0.22	0.28	0.19
13	0.02	0.13	0.07	0.06	0.03	0.09	0.12	0.05	0.02	0.16	0.08	0.07	0.04	0.10	0.14	0.05
14	0.00	0.00	0.01	0.00	0.01		0.01	0.01	0.00	0.00	0.01	0.00	0.01		0.02	0.01
Total	**4.6**	**23.5**	**6.3**	**7.9**	**4.8**	**7.1**	**5.1**	**5.4**	**5.6**	**28.3**	**7.6**	**9.1**	**5.6**	**8.1**	**5.8**	**6.2**

Table 12a. Witch abundance estimates (thousands of fish) from GEAC surveys in NAFO Subdivision 3Ps from 1998 to 2005.

Depth range (fathoms)	Strata	Vessel / Trip / #Sets / Mean Date / sq. mi.	Pennysmart 3 06-Dec 1998	Pennysmart 4 27-Nov 1999	Pennysmart 5 10-Dec 2000	Pennysmart 6 05-Dec 2001	Pennysmart 7 29-Nov 2002	Pennysmart 8 04-Dec 2003	Pennysmart 9 06-Dec 2004	Pennysmart 10 13-Dec 2005
<30	314	974	0	0	0	21	107	0	0	0
	320	1320	100	0	0	10	12	44	14	0
		Subtotal	100	0	0	31	119	44	14	0
31-50	312	272	41	15	8	16	0	89	24	0
	315	827	10	35	0	0	0	134	85	0
	321	1189	0	0	0	13	15	22	0	0
	325	944	0	0	0	0	0	0	0	0
	326	166	0	0	0	0	-	0	0	0
		Subtotal	51	50	8	29	15	245	109	0
51-100	311	317	0	752	18	45	299	297	421	546
	317	193	0	120	0	0	116	261	631	325
	319	984	1548	19271	4416	3424	632	465	345	1509
	322	1567	0	11	16	0	0	16	0	0
	323	696	0	20	0	0	16	0	103	12
	324	494	0	0	0	0	17	0	0	0
		Subtotal	1548	20174	4450	3469	1080	1039	1500	2392
101-150	310	170	69	116	116	0	9	37	134	32
	313	165	290	69	123	903	1474	1594	708	182
	316	189	591	1828	619	223	125	212	156	340
	318	129	290	35	22	1316	748	9	715	742
		Subtotal	1240	2048	880	2442	2356	1852	1713	1296
151-200	705	195	244	184	155	92	173	287	144	256
	706	476	551	580	459	285	396	140	219	374
	707	74	35	77	53	320	55	1882	137	227
		Subtotal	830	841	667	697	624	2309	500	857
201-300	708	126	38	38	24	417	30	655	702	63
	711	593	-	-	-	94	56	132	153	200
	712	731	230	123	198	319	214	301	148	355
	713	851	613	431	107	374	337	483	218	201
		Subtotal	881	592	329	1204	637	1571	1221	819
	Total [1]		4,650	23,705	6,334	7,872	4,831	7,060	5,057	5,364

[1] Totals are for all strata fished. Individual strata totals rounded to nearest 1000.

Table 12b. Witch biomass estimates (t) from GEAC surveys in NAFO Subdivision 3Ps from 1998 to 2005.

Depth range (fathoms)	Strata	Vessel / Trip / #Sets / Mean Date / sq. mi.	Pennysmart 3 06-Dec 1998	Pennysmart 4 27-Nov 1999	Pennysmart 5 10-Dec 2000	Pennysmart 6 05-Dec 2001	Pennysmart 7 29-Nov 2002	Pennysmart 8 04-Dec 2003	Pennysmart 9 06-Dec 2004	Pennysmart 10 13-Dec 2005
<30	314	974	0	0	0	15	58	0	0	0
	320	1320	28	0	0	3	6	33	14	0
		Subtotal	28	0	0	18	64	33	14	0
31-50	312	272	15	8	12	11	0	44	16	0
	315	827	4	9	0	0	0	98	75	0
	321	1189	0	0	0	9	15	44	0	0
	325	944	0	0	0	0	0	0	0	0
	326	166	0	0	0	0	-	0	0	0
		Subtotal	19	17	12	20	15	186	91	0
51-100	311	317	0	215	4	20	116	94	161	179
	317	193	0	38	0	0	38	105	224	105
	319	984	745	7938	2105	1634	343	241	215	737
	322	1567	0	5	8	0	0	16	0	0
	323	696	0	14	0	0	16	0	85	12
	324	494	0	0	0	0	7	0	0	0
		Subtotal	745	8210	2117	1654	520	456	685	1033
101-150	310	170	14	32	44	0	5	19	51	14
	313	165	101	39	59	422	631	682	245	77
	316	189	245	821	254	78	73	76	78	123
	318	129	98	22	17	586	355	4	388	359
		Subtotal	458	914	374	1086	1064	781	762	573
151-200	705	195	67	59	56	30	65	123	49	89
	706	476	198	178	192	112	141	48	102	131
	707	74	33	36	40	167	34	775	80	105
		Subtotal	298	273	288	309	240	946	231	325
201-300	708	126	11	17	13	220	21	273	685	33
	711	593	-	-	-	43	19	39	47	73
	712	731	56	45	91	94	91	97	36	117
	713	851	188	124	59	158	127	182	74	72
		Subtotal	255	186	163	515	258	591	842	295
	Total [1]		1,803	9,600	2,954	3,602	2,161	2,993	2,625	2,226

[1] Totals are for all strata fished. Individual strata totals rounded to nearest 1000.

Table 13. Summary of haddock catches for stratified random survey, NAFO Subdivision 3Ps, 6-18 December 2005.

M.V. Pennysmart									Set Location		HADDOCK		Set	Tow	HADDOCK
Trip	Set	Year	Month	Day	StrLin	Division	Unit Area	Depth (m)	Lat (N)	Long (W)	Catch # of Fish	Catch Weight (kg)	Duration (min)	Distance (n.mi.)	Mean Weight (kg)
10	1	5	12	6	322	3P	M29	172	46.62	55.05	0	0	30	1.5	
10	2	5	12	6	322	3P	M30	146	46.48	55.09	0	0	30	1.5	
10	3	5	12	6	322	3P	M30	153	46.43	55.34	0	0	30	1.5	
10	4	5	12	6	322	3P	M30	167	46.30	55.02	0	0	30	1.5	
10	5	5	12	6	324	3P	N30	101	46.29	54.60	0	0	30	1.5	
10	6	5	12	6	324	3P	N30	119	46.21	54.45	0	0	30	1.6	
10	7	5	12	6	325	3P	N30	83	46.13	54.75	0	0	30	1.6	
10	8	5	12	7	323	3P	N30	144	46.09	54.84	0	0	30	1.5	
10	9	5	12	7	323	3P	M30	148	46.00	55.25	0	0	30	1.5	
10	10	5	12	7	322	3P	M30	126	46.25	55.66	0	0	30	1.5	
10	11	5	12	7	321	3P	M30	56	46.14	55.75	0	0	30	1.4	
10	12	5	12	7	321	3P	M30	80	46.24	55.86	0	0	30	1.5	
10	13	5	12	7	322	3P	M30	129	46.31	55.76	0	0	30	1.5	
10	14	5	12	7	322	3P	M30	137	46.48	55.78	0	0	30	1.5	
10	15	5	12	8	321	3P	M31	60	45.74	55.57	0	0	30	1.5	
10	16	5	12	8	321	3P	M31	81	45.69	55.40	0	0	30	1.5	
10	17	5	12	8	323	3P	M31	148	45.74	55.35	0	0	30	1.5	
10	18	5	12	8	323	3P	M31	138	45.64	55.11	0	0	30	1.5	
10	19	5	12	8	325	3P	N31	63	45.69	54.92	0	0	30	1.5	
10	20	5	12	8	325	3P	N31	69	45.85	54.79	0	0	30	1.5	
10	21	5	12	8	325	3P	N31	80	45.85	54.70	0	0	30	1.4	
10	22	5	12	8	326	3P	N31	81	45.74	54.43	0	0	30	1.5	
10	23	5	12	8	326	3P	N31	84	45.56	54.43	0	0	30	1.6	
10	24	5	12	8	325	3P	N31	78	45.55	54.88	0	0	30	1.5	
10	25	5	12	8	319	3P	N31	104	45.55	54.99	0	0	30	1.5	
10	26	5	12	9	319	3P	M32	128	45.50	55.38	0	0	30	1.5	
10	27	5	12	9	315	3P	M31	70	45.50	55.54	0	0	30	1.5	
10	28	5	12	9	320	3P	M31	55	45.65	55.66	0	0	30	1.5	
10	29	5	12	9	321	3P	M31	67	45.80	55.49	0	0	30	1.6	
10	30	5	12	9	321	3P	M31	67	45.91	55.69	0	0	30	1.6	
10	31	5	12	9	320	3P	L31	49	45.78	56.07	0	0	30	1.5	
10	32	5	12	9	320	3P	L31	48	45.79	56.49	0	0	30	1.5	
10	33	5	12	9	320	3P	L31	52	45.95	56.51	0	0	30	1.6	
10	34	5	12	9	314	3P	L30	54	46.22	56.69	0	0	30	1.5	
10	35	5	12	10	312	3P	L30	63	46.20	56.76	0	0	30	1.5	
10	36	5	12	10	314	3P	K30	47	46.29	57.01	0	0	30	1.5	
10	38	5	12	13	312	3P	K29	77	46.74	57.03	1	5.5	30	1.5	5.5
10	39	5	12	13	311	3P	K29	100	46.81	57.04	1	6.5	30	1.6	6.5
10	40	5	12	13	310	3P	K29	219	46.81	57.30	12	34	30	1.6	2.8
10	41	5	12	13	310	3P	K29	243	46.77	57.37	2	8	30	1.5	4.0
10	42	5	12	13	313	3P	K29	262	46.63	57.50	1	4.5	30	1.6	4.5
10	43	5	12	13	313	3P	K29	206	46.50	57.44	1	2.5	30	1.5	2.5
10	44	5	12	14	311	3P	K30	136	46.25	57.19	0	0	30	1.5	
10	45	5	12	14	705	3P	K30	340	46.12	57.28	0	0	30	1.5	
10	46	5	12	14	705	3P	K30	321	46.07	57.18	0	0	30	1.6	
10	47	5	12	14	706	3P	L31	356	45.80	56.93	0	0	30	1.6	
10	48	5	12	14	317	3P	L31	125	45.69	56.63	0	0	30	1.5	
10	49	5	12	14	316	3P	L31	231	45.61	56.60	0	0	30	1.5	
10	50	5	12	14	316	3P	L31	203	45.56	56.55	0	0	30	1.5	
10	51	5	12	14	706	3P	L32	353	45.30	56.49	0	0	30	1.5	
10	52	5	12	14	315	3P	L32	77	45.20	56.10	0	0	30	1.5	
10	53	5	12	15	320	3P	M32	46	45.43	55.93	0	0	30	1.5	
10	54	5	12	15	315	3P	M32	76	45.22	55.78	0	0	30	1.5	
10	55	5	12	15	315	3P	M32	79	45.05	55.80	0	0	30	1.5	
10	56	5	12	15	317	3P	M33	127	44.95	55.94	0	0	30	1.4	
10	57	5	12	15	318	3P	M33	208	44.91	55.92	60	156	30	1.4	2.6
10	58	5	12	15	319	3P	M32	114	45.02	55.59	0	0	30	1.4	
10	59	5	12	15	707	3P	M33	323	44.99	55.53	0	0	30	1.5	
10	60	5	12	15	318	3P	M32	245	45.03	55.37	19	37	30	1.5	1.9
10	62	5	12	16	707	3P	N32	338	45.06	54.76	0	0	30	1.5	
10	63	5	12	16	319	3P	N32	101	45.15	54.78	0	0	30	1.5	
10	64	5	12	16	319	3P	M32	155	45.37	55.15	7	15	30	1.6	2.1
10	65	5	12	16	319	3P	M32	168	45.31	55.36	91	189	30	1.4	2.1
10	74	5	12	17	708	3P	M33	425	45.00	55.49	1	2	30	1.6	2.0
10	75	5	12	17	708	3P	M33	506	44.91	55.59	0	0	30	1.5	
10	76	5	12	17	711	3P	L32	390	45.14	56.51	0	0	30	1.5	
10	77	5	12	17	711	3P	L32	392	45.39	56.75	0	0	30	1.6	
10	78	5	12	18	712	3P	L31	410	45.60	56.96	0	0	30	1.6	
10	79	5	12	18	712	3P	K31	411	45.88	57.10	0	0	30	1.5	
10	80	5	12	18	713	3P	K31	486	45.98	57.62	0	0	30	1.5	
10	81	5	12	18	713	3P	K30	456	46.17	57.60	0	0	30	1.6	
									Minimum		0.0	0.0	30.0	1.4	1.9
									Maximum		91.0	189.0	30.0	1.6	6.5
									Mean		2.8	6.5	30.0	1.5	2.3
									Median		0.0	0.0	30.0	1.5	2.6
									Standard Error		0.2	0.4	0.0	0.0	0.0
									Total		196.0	460.0			

Notes: Sets 66-73 were tagging sets and are excluded from the stratified random survey
Sets 37 and 61 were unsuccessful

Table 14. Haddock catch summary from GEAC fall surveys in NAFO Subdivision 3Ps from 1997 to 2005.

Vessel	Pennysmart	Pennysmart	Pennysmart	Pennysmart	Pennysmart	Pennysmart	Pennysmart	Pennysmart	Pennysmart
Trip	2	3	4	5	6	7	8	9	10
#Sets	84	86	90	73	91	75	89	86	71
Mean Date	12-Dec 1997	06-Dec 1998	27-Nov 1999	10-Dec 2000	05-Dec 2001	29-Nov 2002	04-Dec 2003	06-Dec 2004	13-Dec 2005
Set Numbers									
#Sets w/ Haddock	7	9	9	14	18	12	9	11	11
Maximum	50	11	44	91	853	142	483	82	91
Mean	1.4	0.4	1.7	3.3	12.6	4.2	7.3	2.3	2.8
Total	118	35	152	238	1151	317	740	195	196
Set Weights (kg)									
Maximum	130.0	26.0	136.5	150.0	618.4	179.4	630.8	158.0	189.0
Mean	3.8	1.2	4.4	4.7	11.7	5.5	10.3	4.2	6.5
Total	320.0	105.2	396.4	341.1	1067.6	409.4	1038.3	362.0	460
Mean Fish Weight (kg)	2.7	3.0	2.6	1.4	0.9	1.3	1.4	1.9	2.3
Largest Sets	1997	1998	1999	2000	2001	2002	2003	2004	2005
1 - Weight/#s	130/50	26/11	136.5/44	150/91	618.4/853	179.4/142	630.8/483	158/82	189/91
2	111.4/34	16.6/5	96/27	46/30	101.2/88	161/136	313/192	98/51	156/60
3	37.4/16	15/5	45/25	25/30	90.5/53	22/17	45/34	46/39	37/19
4	25/13	14/5	42/19	25/18	50.8/50	11/5	18/15	38/16	34/12
5	14.6/3	10/3	39.6/13	21/16	49.5/39	10/5	18/11	5/1	15/7

Table 15a. Haddock abundance estimates (thousands of fish) from GEAC surveys in NAFO Subdivision 3Ps from 1997 to 2005.

Depth range (fathoms)	Strata	Vessel / Trip / #Sets / Mean Date / sq. mi.	Pennysmart 2 12-Dec 1997	Pennysmart 3 06-Dec 1998	Pennysmart 4 27-Nov 1999	Pennysmart 5 10-Dec 2000	Pennysmart 6 05-Dec 2001	Pennysmart 7 29-Nov 2002	Pennysmart 8 04-Dec 2003	Pennysmart 9 06-Dec 2004	Pennysmart 10 13-Dec 2005
<30	314	974	0	25	62	0	648	10	0	0	0
	320	1320	0	0	0	400	130	0	0	13	0
		Subtotal	0	25	62	400	778	10	0	13	0
31-50	312	272	0	0	0	147	0	8	15	0	8
	315	827	0	0	0	13	0	0	0	11	0
	321	1189	0	0	0	0	0	0	0	0	0
	325	944	0	0	0	0	0	0	0	0	0
	326	166	0	0	0	0	0	.	0	0	0
		Subtotal	0	0	0	160	0	8	15	11	8
51-100	311	317	0	0	0	27	9	0	0	0	8
	317	193	0	0	0	0	12	6	0	0	0
	319	984	823	123	407	1658	211	1629	377	541	1153
	322	1567	.	0	0	0	0	0	0	0	0
	323	696	0	0	0	0	0	0	0	0	0
	324	494	.	0	0	0	0	0	0	0	0
		Subtotal	823	123	407	1685	232	1635	377	541	1161
101-150	310	170	14	23	0	51	231	37	56	74	61
	313	165	0	6	139	89	240	5	5	6	11
	316	189	6	0	72	167	507	21	5	11	0
	318	129	61	38	275	46	4039	630	3092	527	363
		Subtotal	81	67	486	353	5017	693	3158	618	435
151-200	705	195	0	0	0	0	0	0	0	0	0
	706	476	0	0	0	0	0	10	0	0	0
	707	74	0	0	0	0	7	0	37	3	0
		Subtotal	0	0	0	0	7	10	37	3	0
201-300	708	126	.	4	0	0	0	0	0	0	4
	711	593	.	.	.	.	0	0	0	0	0
	712	731	.	0	0	0	0	0	0	0	0
	713	851	.	0	0	0	0	0	0	0	0
		Subtotal	0	4	0	0	0	0	0	0	4
	Total [1]		904	219	955	2,598	6,034	2,356	3,587	1,186	1,608

[1] Totals are for all strata fished. Individual strata totals rounded to nearest 1000.

. denotes strata not fished

Table 15b. Haddock biomass estimates (t) from GEAC surveys in NAFO Subdivision 3Ps from 1997 to 2005.

Depth range (fathoms)	Strata	Vessel / Trip / #Sets / Mean Date / sq. mi.	Pennysmart 2 12-Dec 1997	Pennysmart 3 06-Dec 1998	Pennysmart 4 27-Nov 1999	Pennysmart 5 10-Dec 2000	Pennysmart 6 05-Dec 2001	Pennysmart 7 29-Nov 2002	Pennysmart 8 04-Dec 2003	Pennysmart 9 06-Dec 2004	Pennysmart 10 13-Dec 2005
<30	314	974	0	123	25	0	1312	29	0	0	0
	320	1320	0	0	0	200	508	0	0	50	0
		Subtotal	0	123	25	200	1820	29	0	50	0
31-50	312	272	0	0	0	171	0	23	53	0	45
	315	827	0	0	0	13	0	0	0	56	0
	321	1189	0	0	0	0	0	0	0	0	0
	325	944	0	0	0	0	0	0	0	0	0
	326	166	0	0	0	0	0	.	0	0	0
		Subtotal	0	0	0	184	0	23	53	56	45
51-100	311	317	0	0	0	30	12	0	0	0	55
	317	193	0	0	0	0	14	9	0	0	0
	319	984	2297	327	1139	2823	483	2098	499	1035	2399
	322	1567	.	0	0	0	0	0	0	0	0
	323	696	0	0	0	0	0	0	0	0	0
	324	494	.	0	0	0	0	0	0	0	0
		Subtotal	2297	327	1139	2853	509	2107	499	1035	2454
101-150	310	170	68	65	0	60	235	69	95	176	185
	313	165	0	20	234	86	296	10	13	17	37
	316	189	1	0	251	256	584	57	8	36	0
	318	129	115	112	767	103	2945	754	4309	889	890
		Subtotal	184	197	1252	505	4060	890	4425	1118	1112
151-200	705	195	0	0	0	0	0	0	0	0	0
	706	476	0	0	0	0	0	14	0	0	0
	707	74	0	0	0	0	5	0	45	5	0
		Subtotal	0	0	0	0	5	14	45	5	0
201-300	708	126	.	20	0	0	0	0	0	0	8
	711	593	.	.	.	.	0	0	0	0	0
	712	731	.	0	0	0	0	0	0	0	0
	713	851	.	0	0	0	0	0	0	0	0
		Subtotal	0	20	0	0	0	0	0	0	8
	Total [1]		2,481	667	2,416	3,742	6,394	3,063	5,022	2,264	3,619

[1] Totals are for all strata fished. Individual strata totals rounded to nearest 1000.
. denotes strata not fished

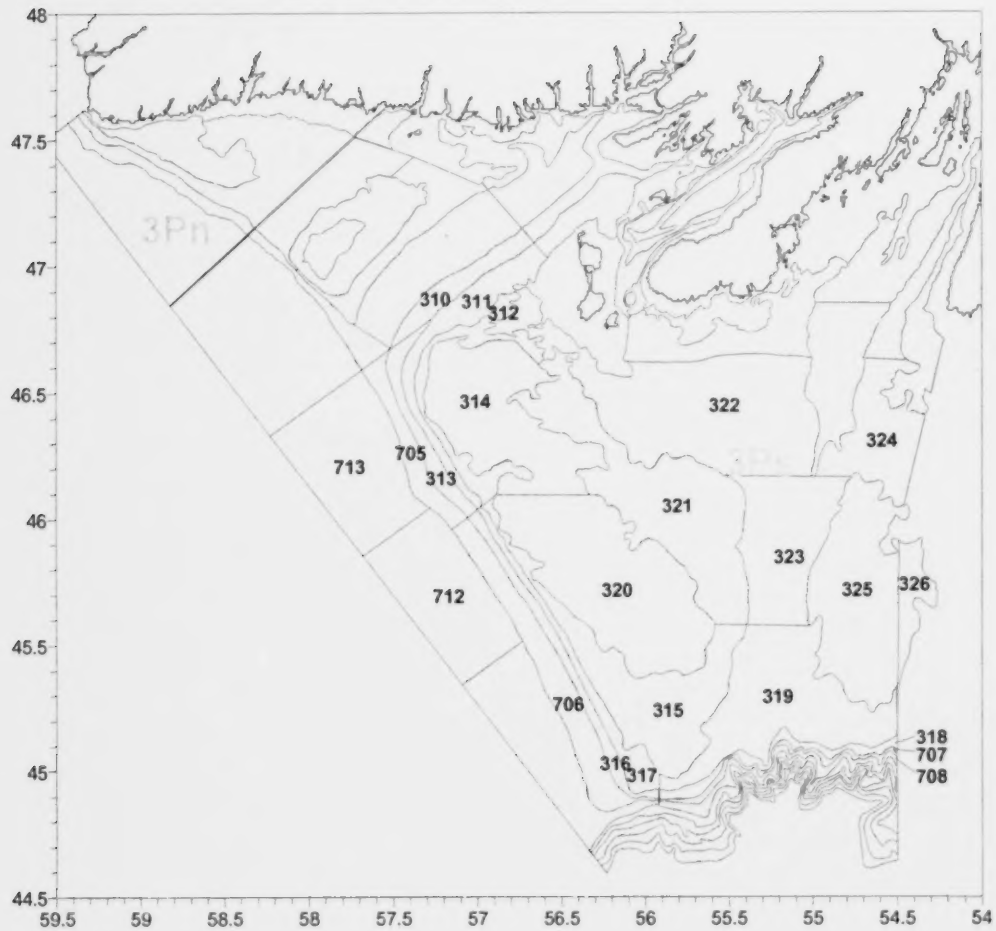


Figure 1. Stratum boundaries within NAFO Division 3P. Numbered strata indicate those surveyed during fall GEAC bottom trawl survey of Subdivision 3Ps. Dashed line is boundary of French economic zone which was not surveyed.

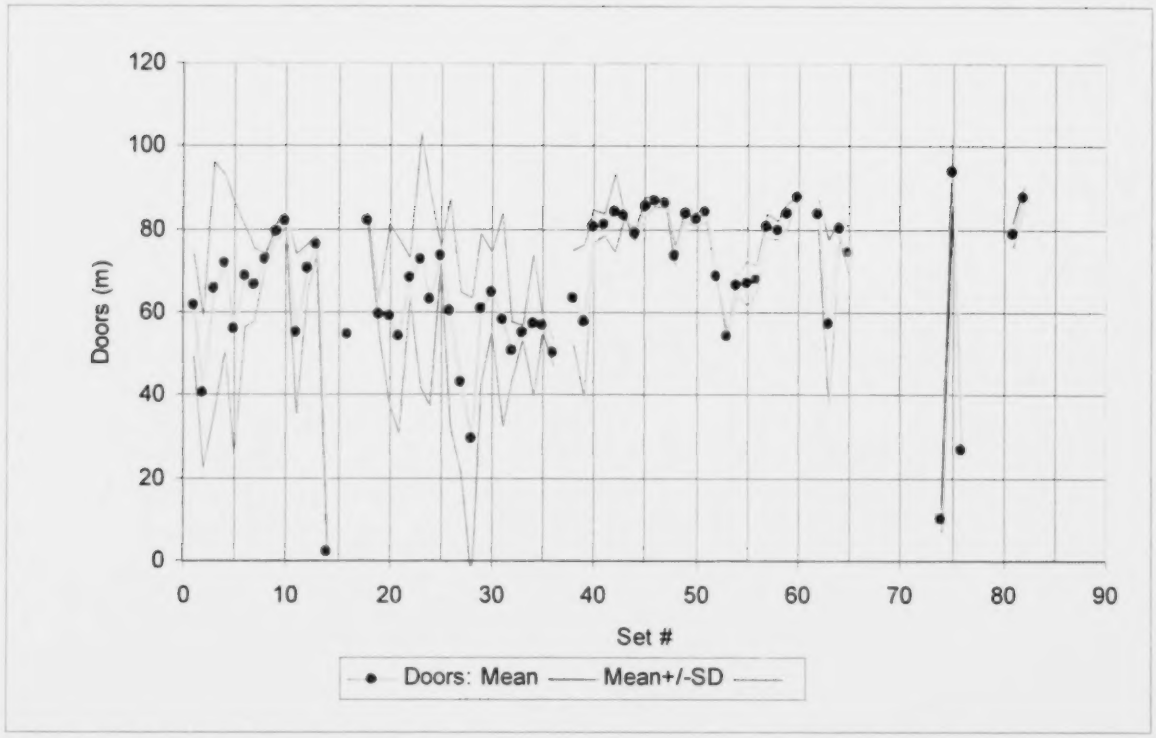


Figure 2a. 2005 3Ps survey net doors.

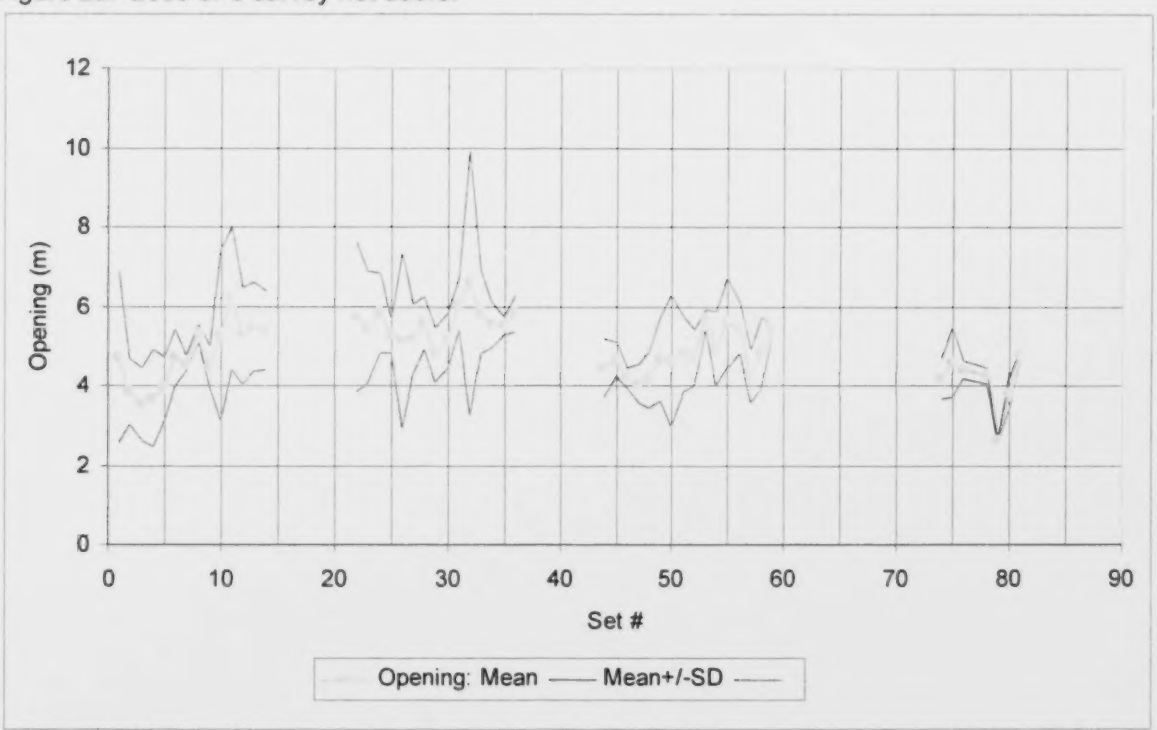


Figure 2b. 2005 3Ps survey net opening.

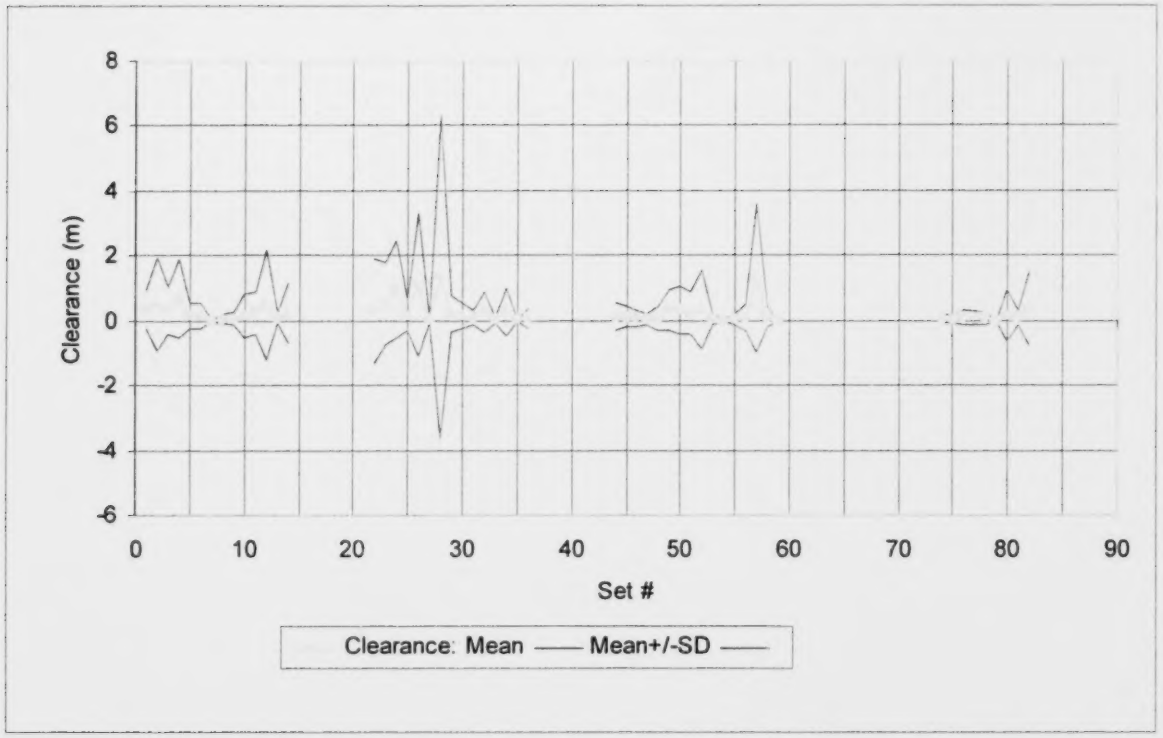


Figure 2c. 2005 3Ps survey net clearance.

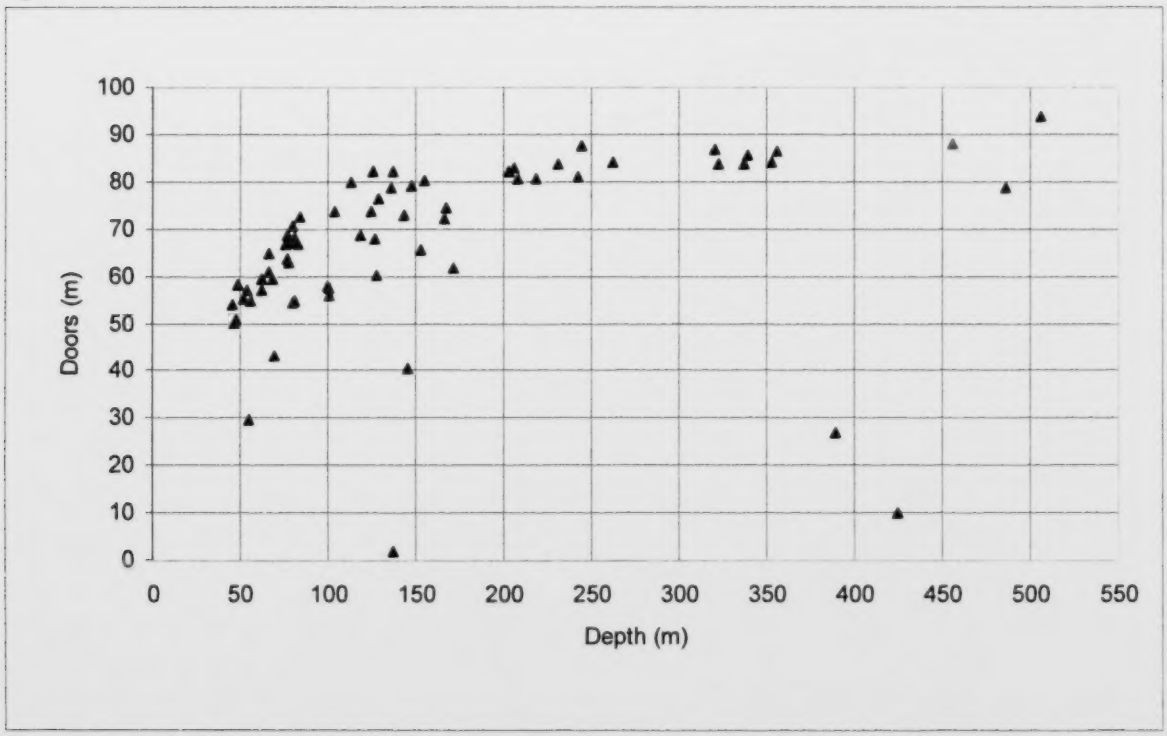


Figure 2d. 2005 3Ps survey net doors vs. set depth.

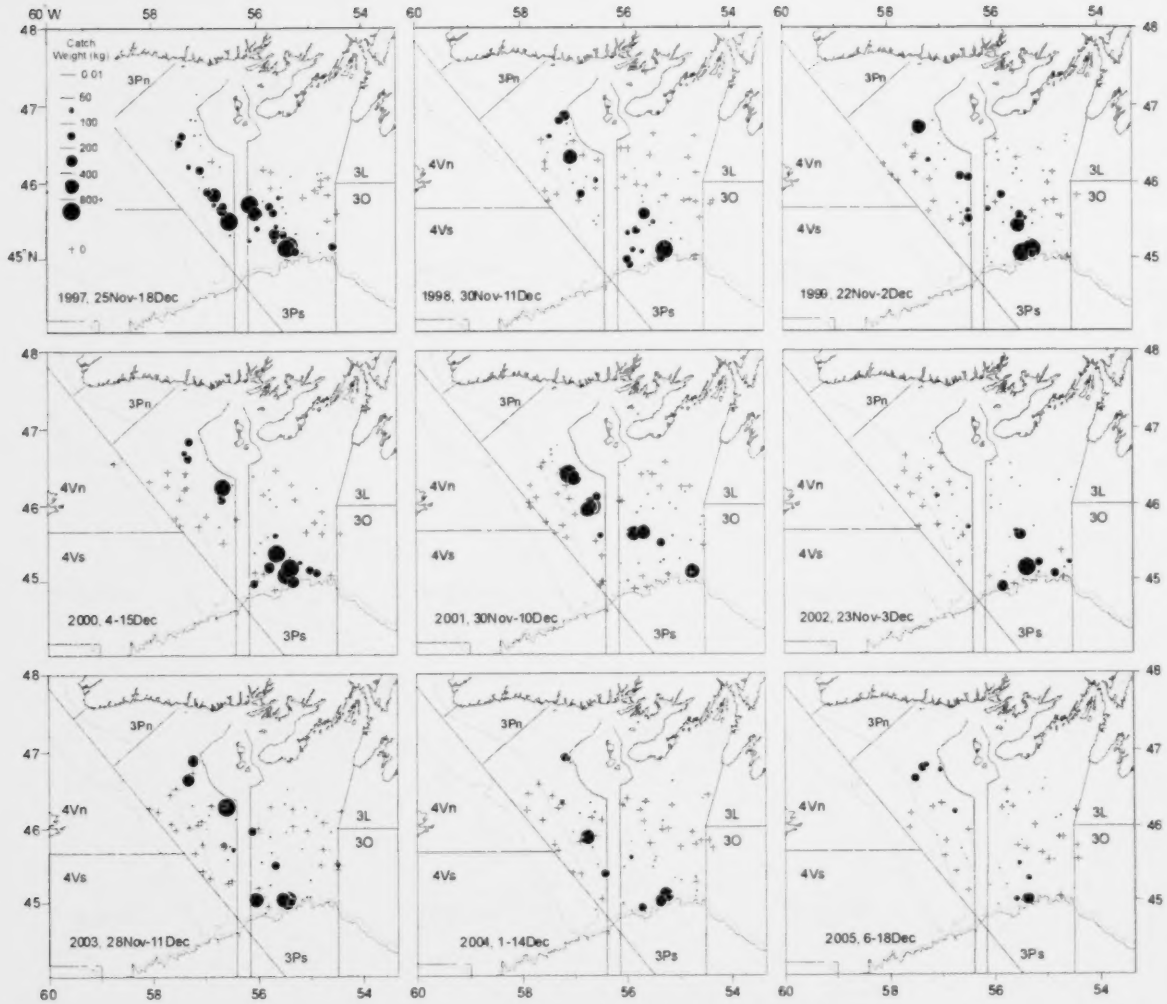


Figure 3. Cod catch weight distribution from GEAC stratified random surveys, Subdivision 3Ps, 1997-2005. The 200, 400, and 800 m depth contours are shown.

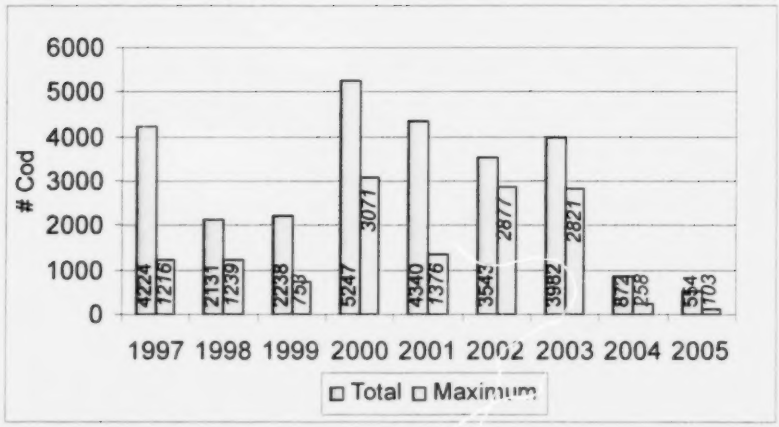


Figure 4a. GEAC fall 3Ps cod numbers.

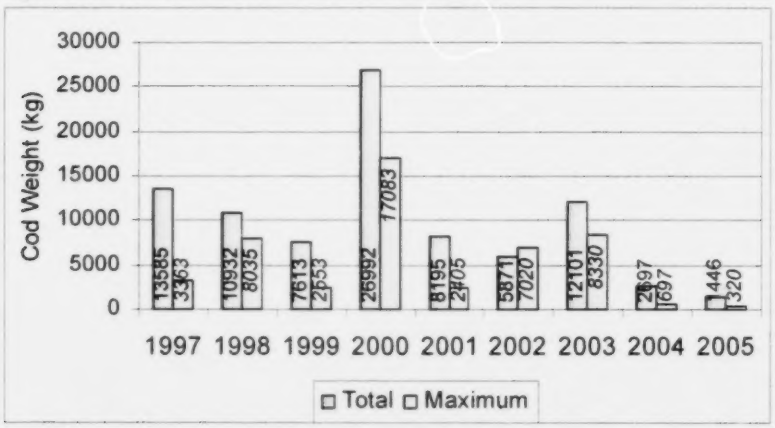


Figure 4b. GEAC fall 3Ps cod weights.

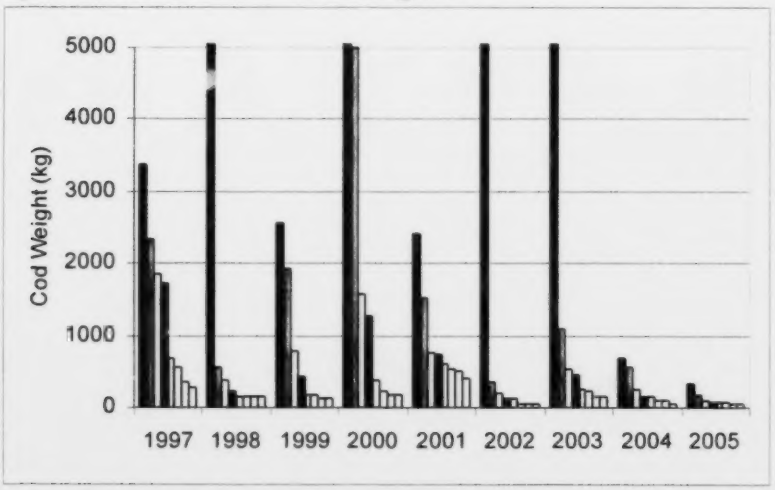


Figure 4c. GEAC fall 3Ps surveys: largest cod set weights.

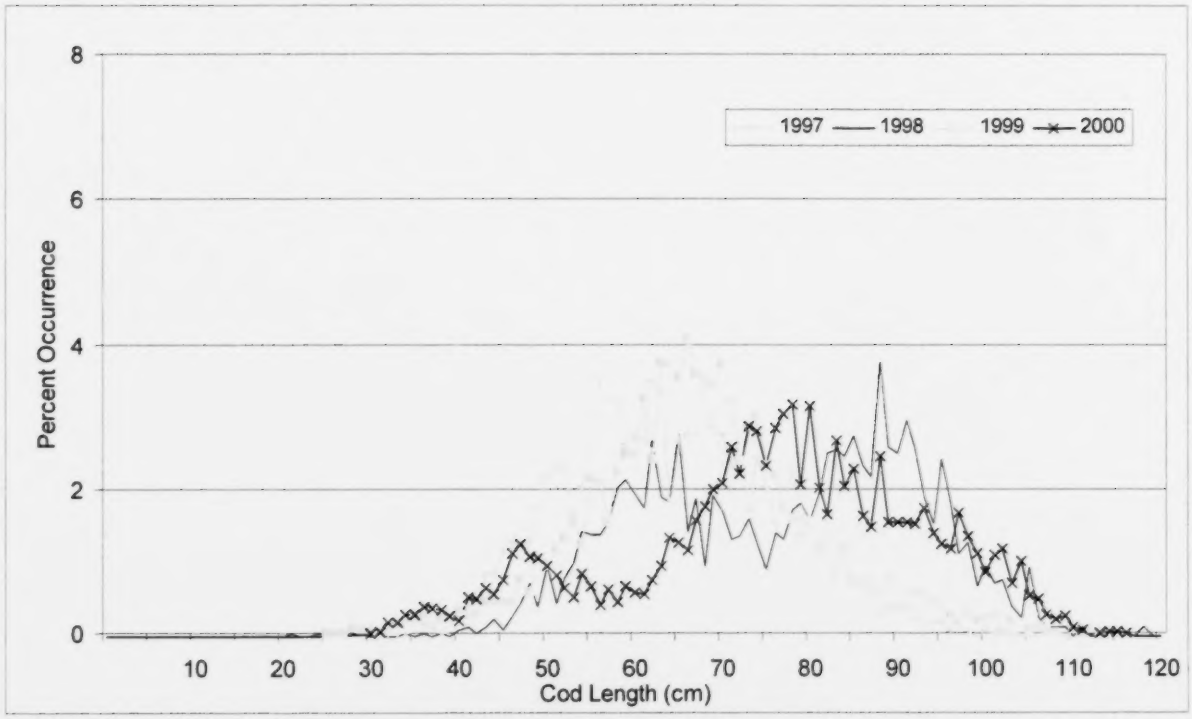


Figure 5a. Length composition of cod (3Ps stratified random surveys 1997-2000).

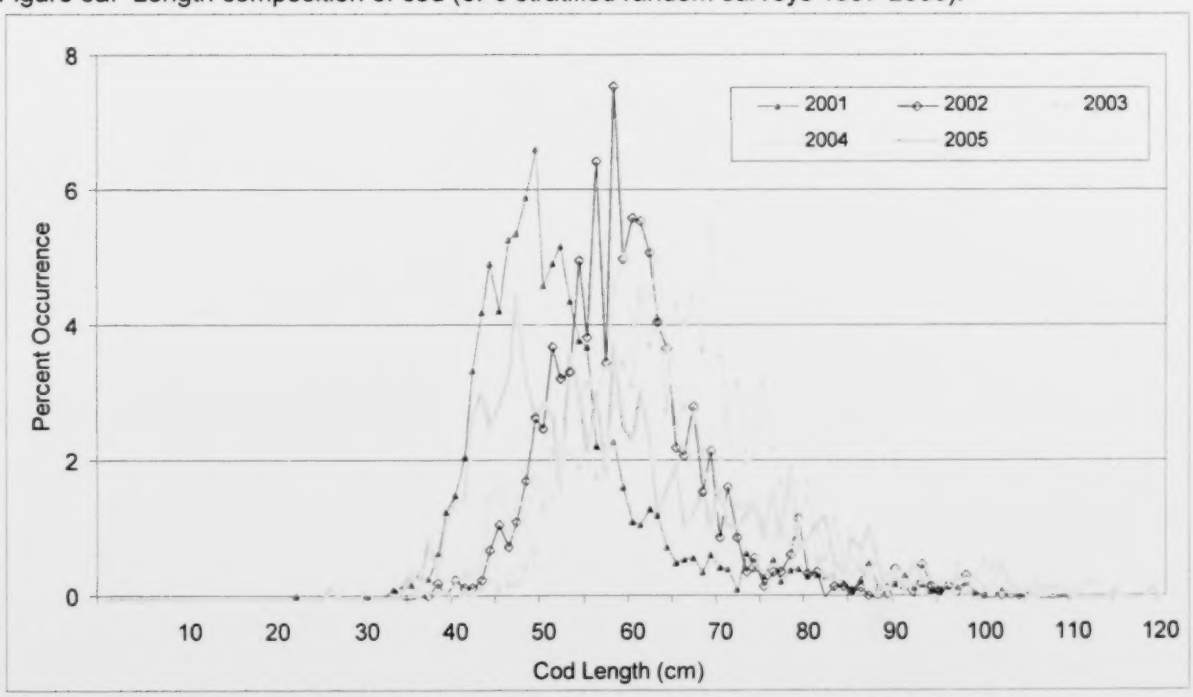


Figure 5b. Length composition of cod (3Ps stratified random surveys 2001-2005).

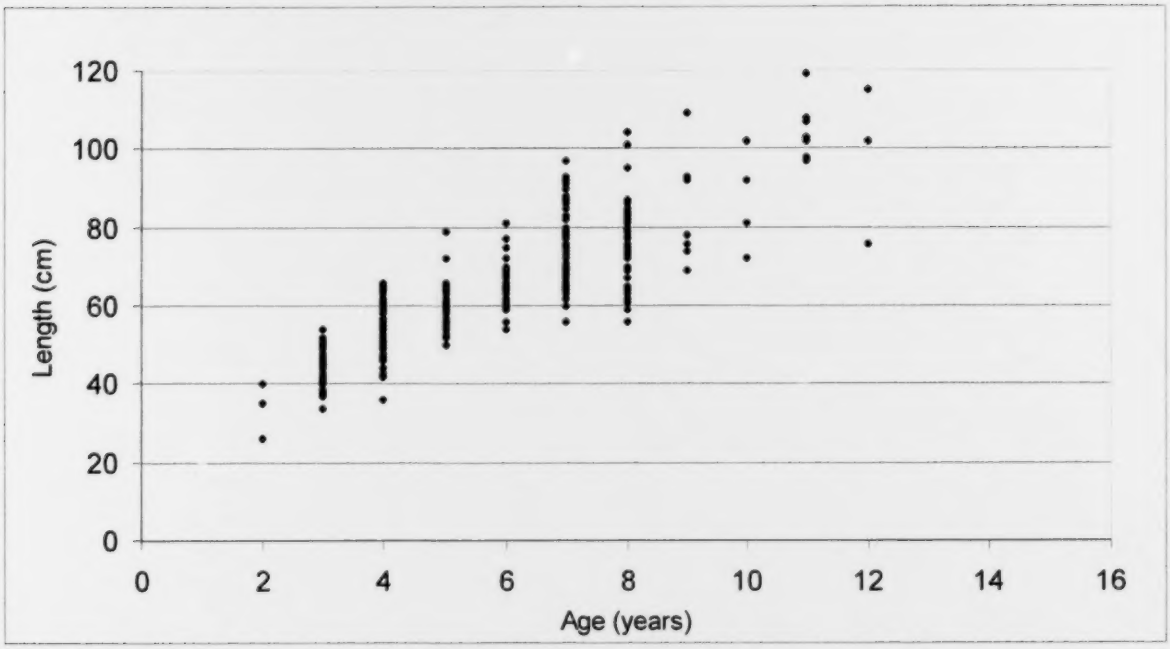


Figure 6a. Cod age-length composition 3Ps 2005 (414 samples).

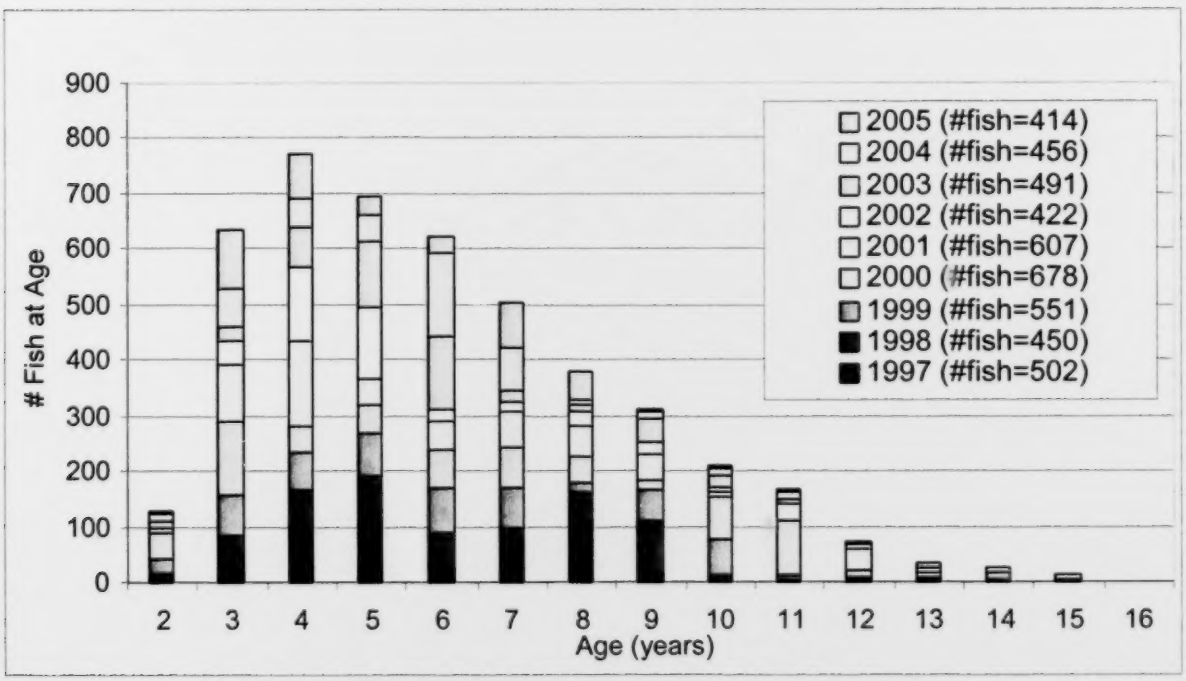


Figure 6b. Age composition of 3Ps sampled cod.

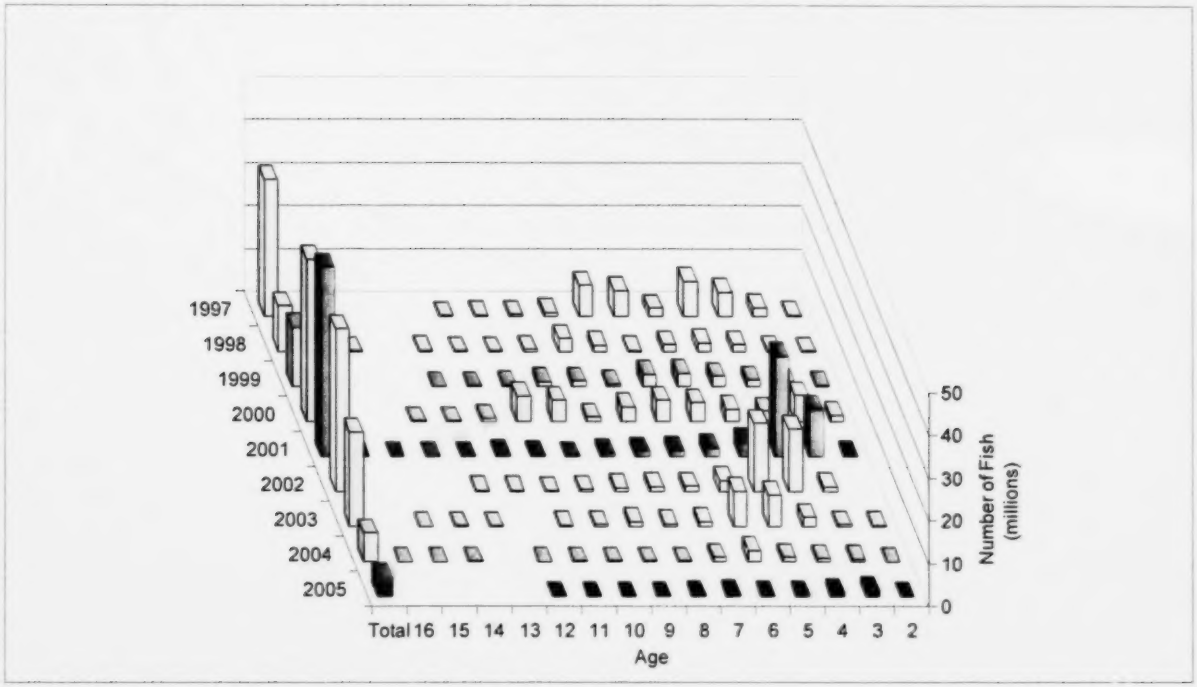


Figure 7. Cod, 3Ps, 1997-2005, estimated age composition.

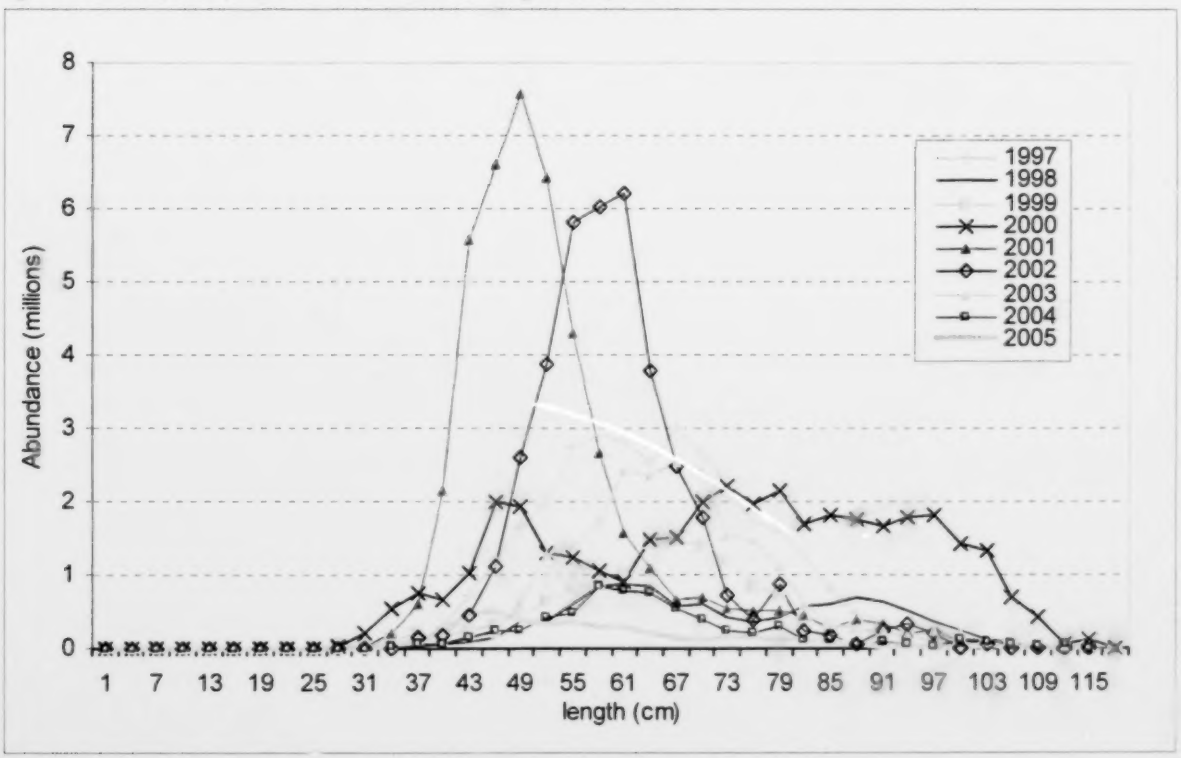


Figure 8. Cod survey abundance index at length, 3Ps, 1997-2005.

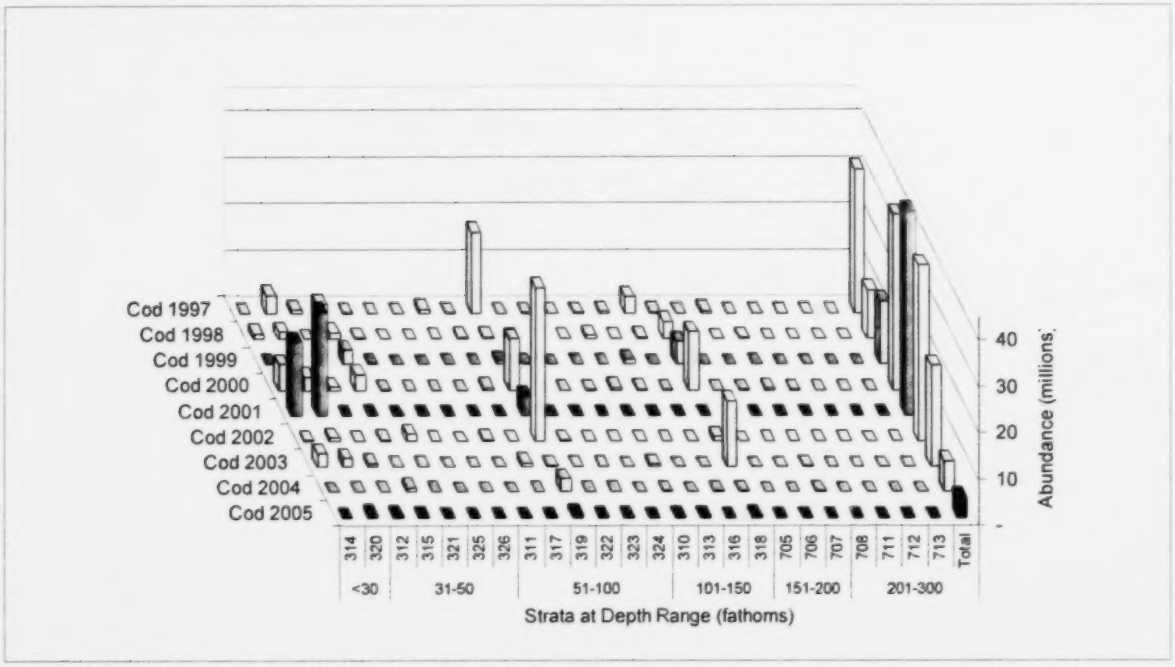


Figure 9. Cod, 3Ps, 1997-2005, estimated abundance.

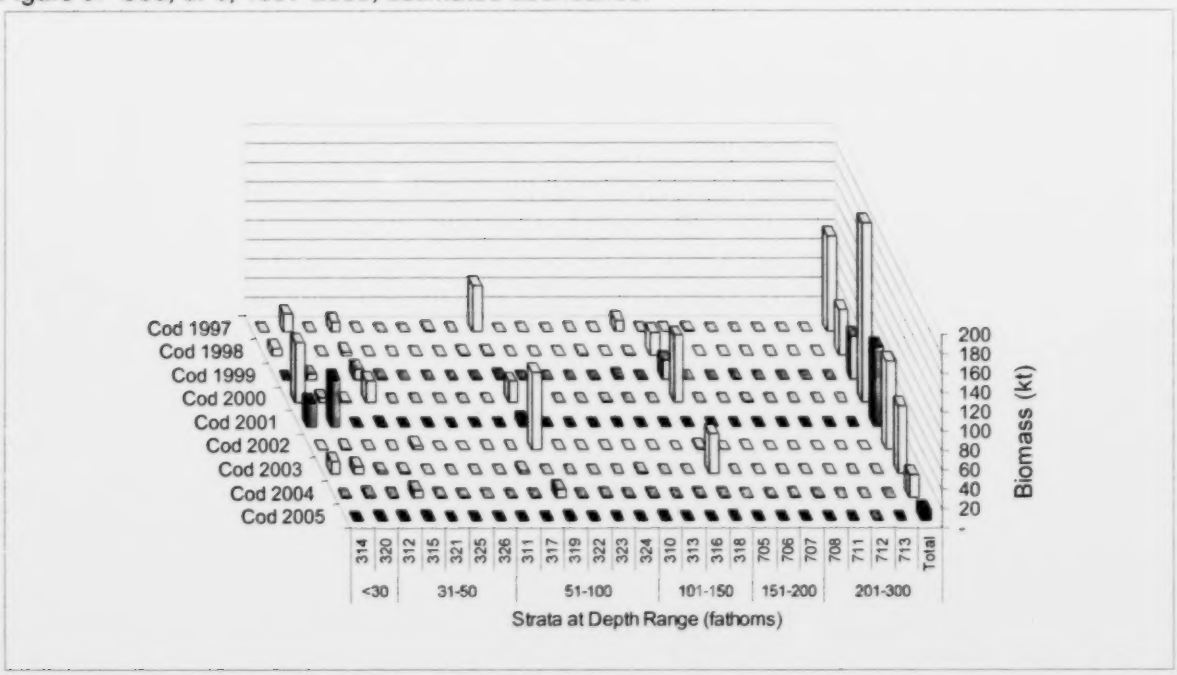


Figure 10. Cod, 3Ps, 1997-2005, estimated biomass.

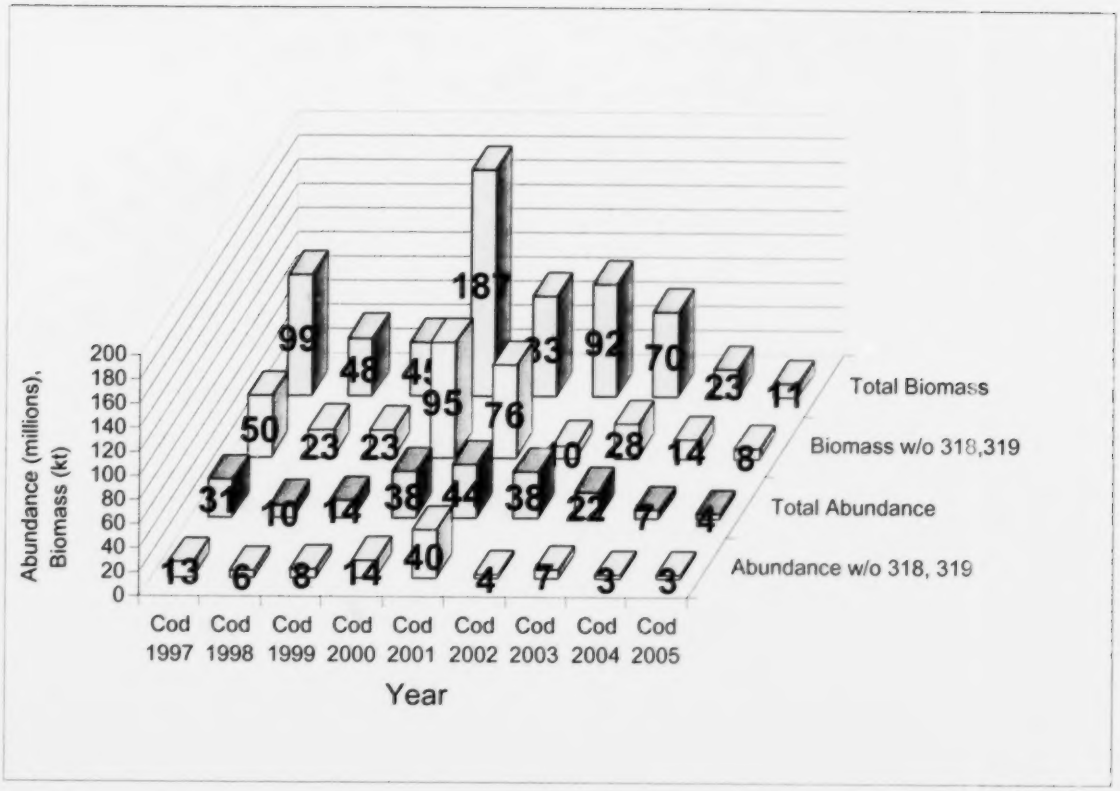


Figure 11. Cod , 3Ps, 1997-2005, estimated abundance and biomass.

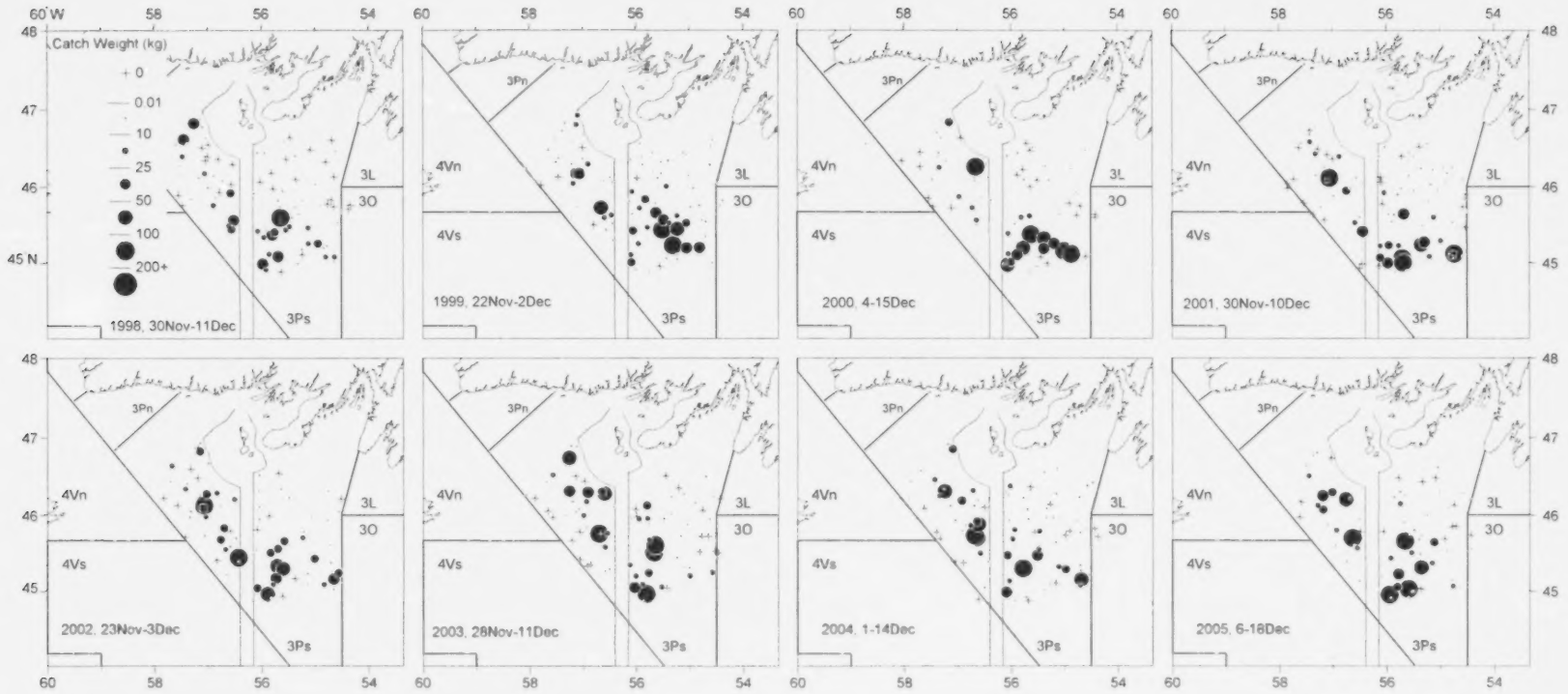


Figure 12. American Plaice catch weight distribution from GEAC stratified random surveys, Subdivision 3Ps, 1998-2005. The 200, 400, and 800 m depth contours are shown.

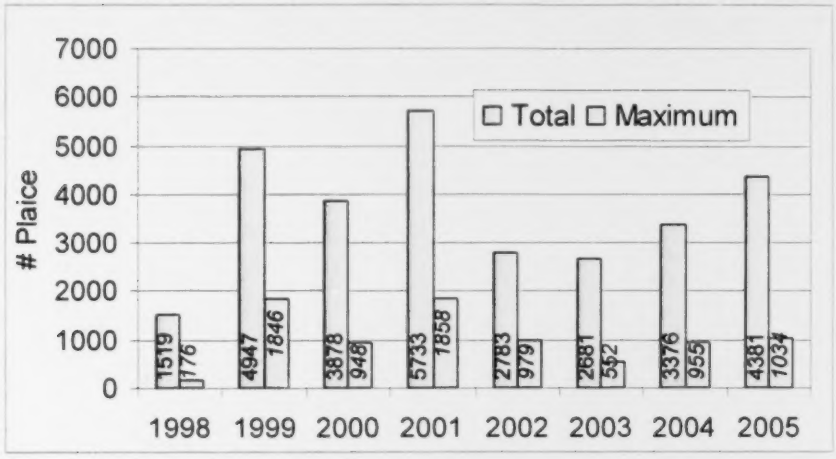


Figure 13a. GEAC fall 3Ps plaice numbers.

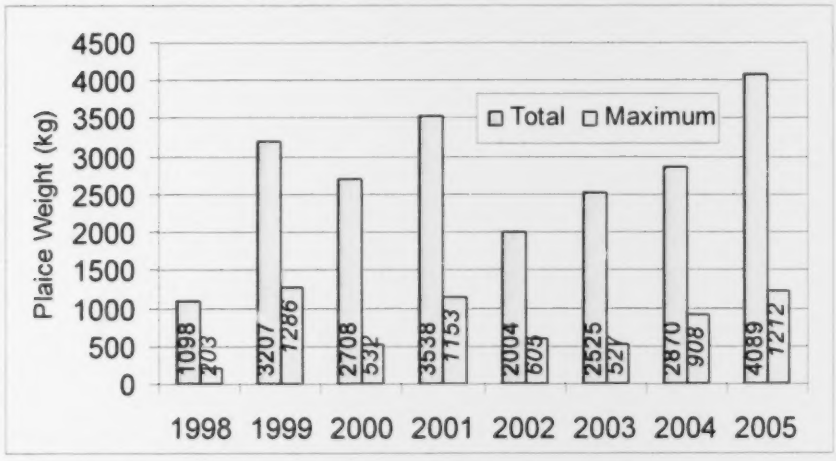


Figure 13b. GEAC fall 3Ps plaice weights.

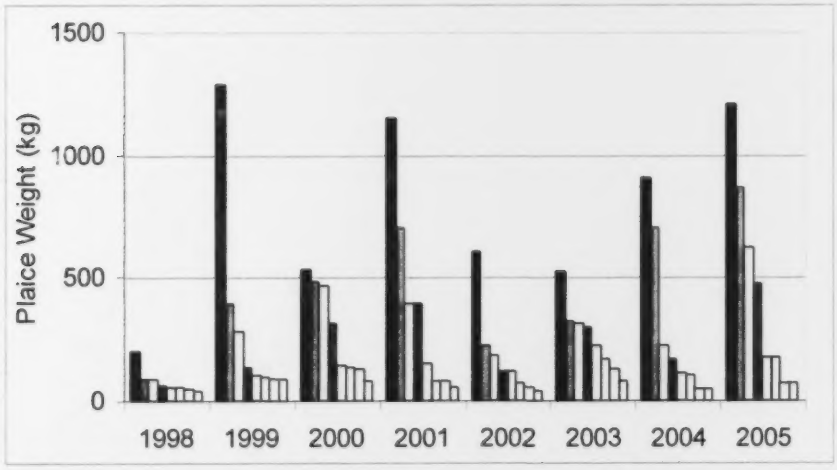


Figure 13c. GEAC fall 3Ps: largest plaice set weights.

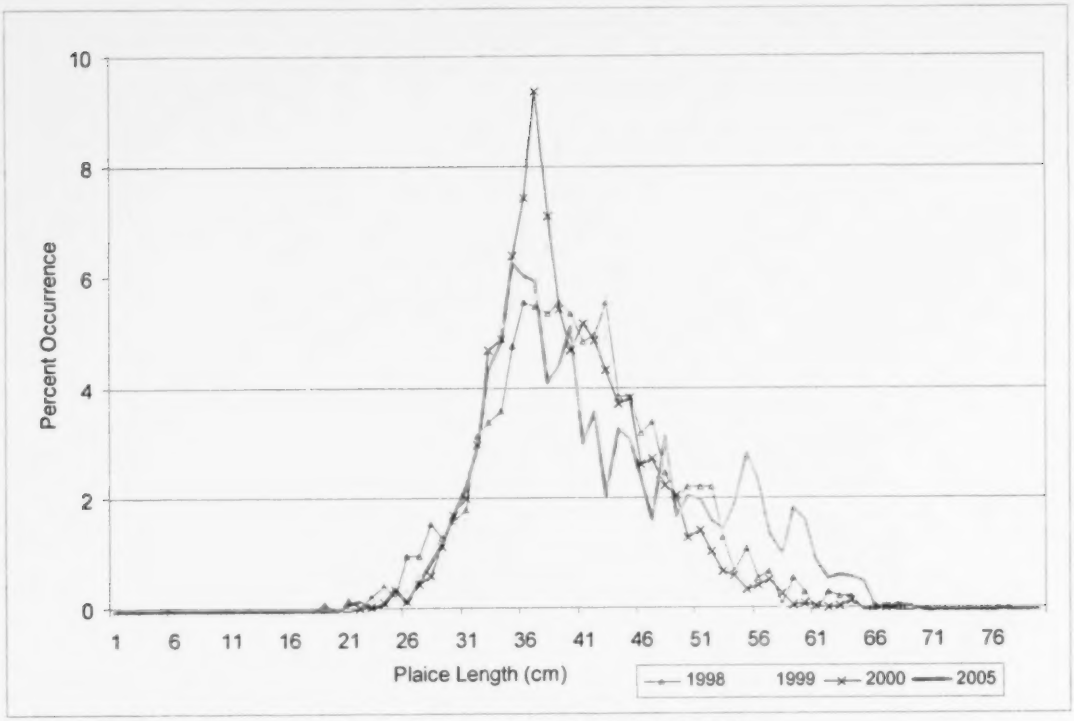


Figure 14a. Length composition of 3Ps plaice: 1998-2000, 2005.

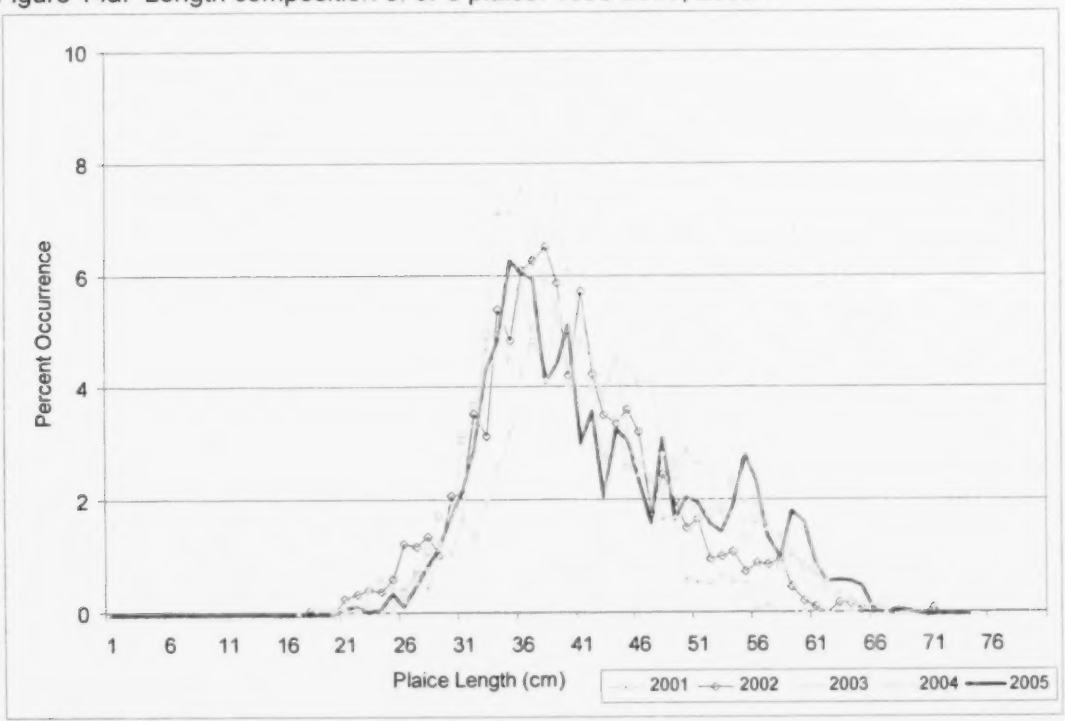


Figure 14b. Length composition of 3Ps plaice: 2001-2005.

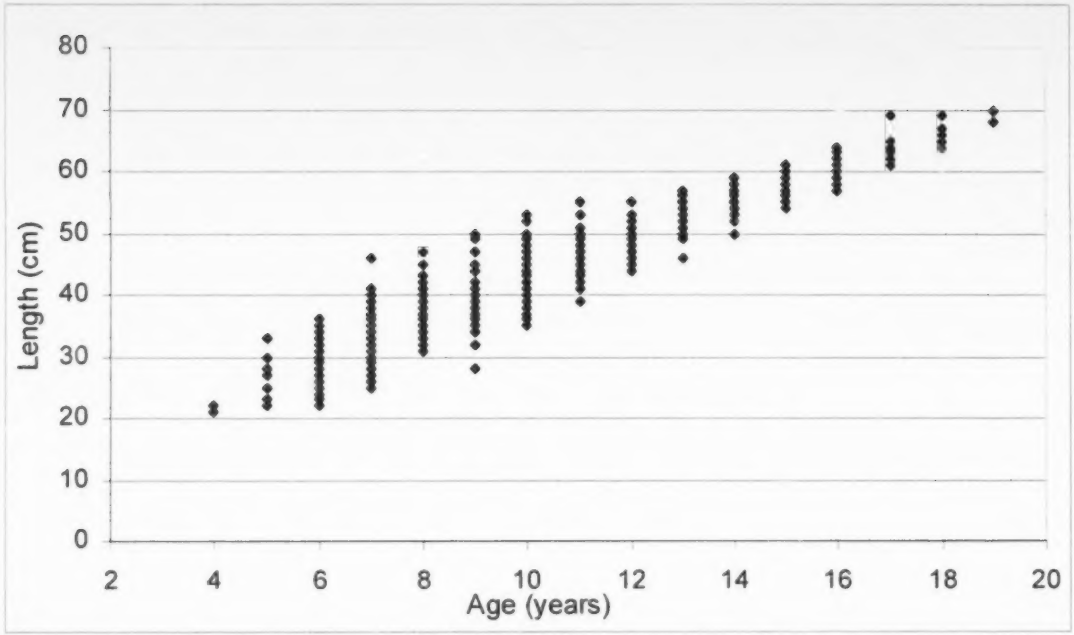


Figure 15a. Plaice age-length composition 3Ps 2005 (723 samples).

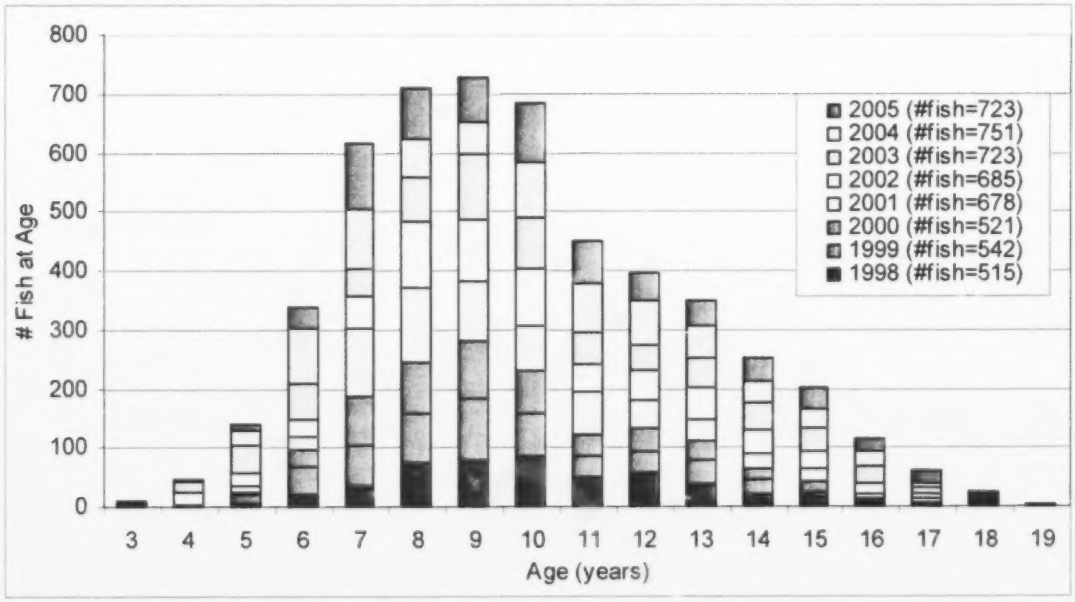


Figure 15b. Age composition of 3Ps sampled plaice.

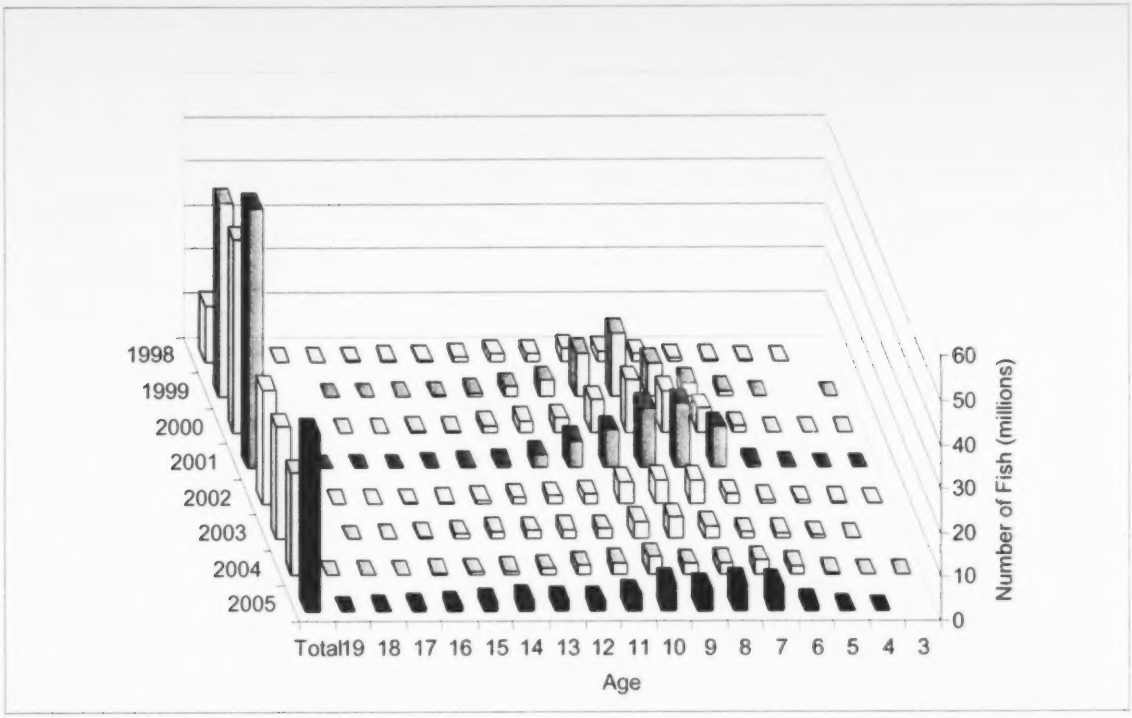


Figure 16. Plaice, 3Ps, 1998-2005, estimated age composition.

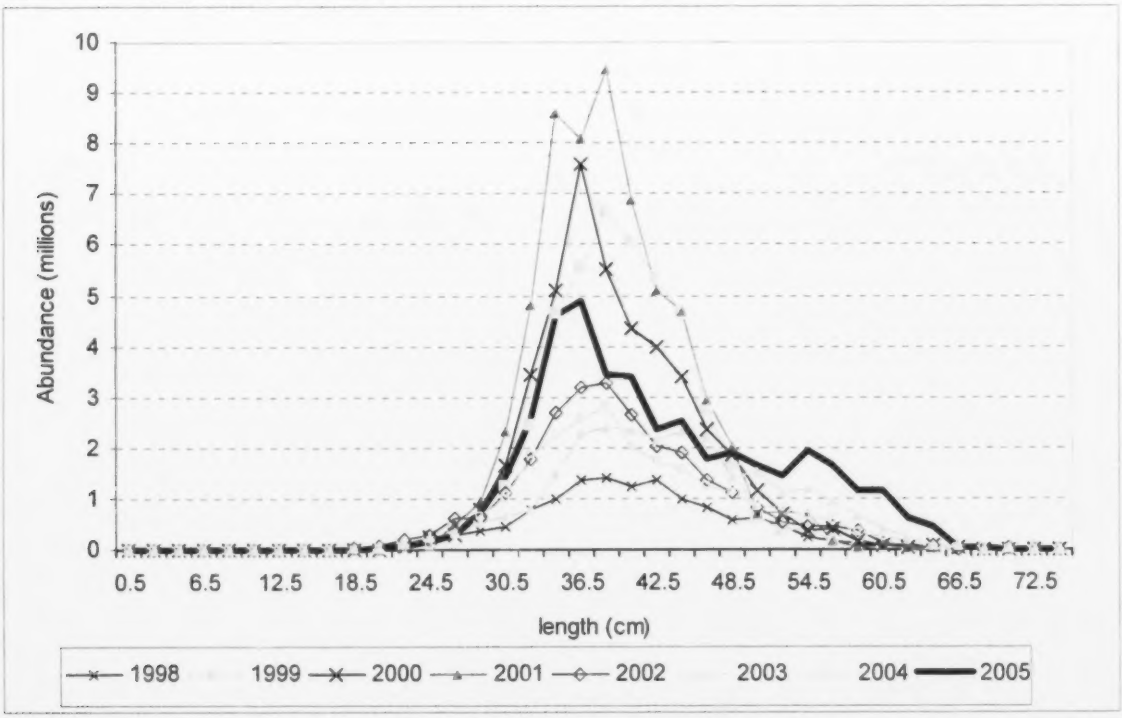


Figure 17. Plaice survey abundance index at length, 3Ps, 1998-2005.

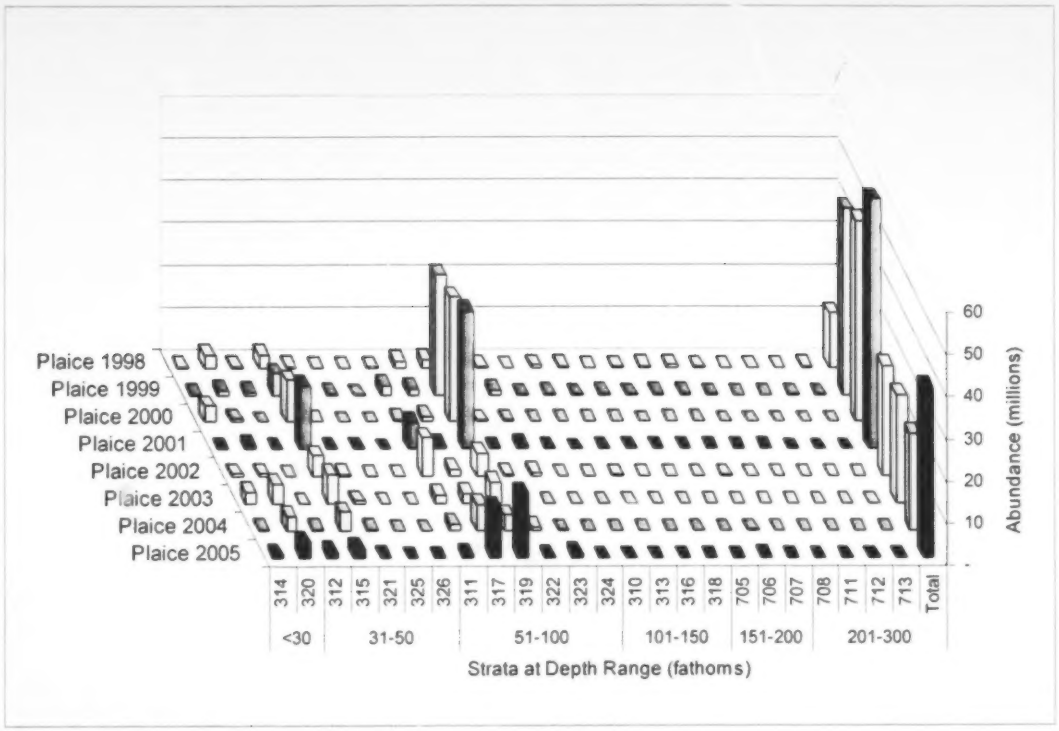


Figure 18. Plaice, 3Ps, 1998-2005, estimated abundance.

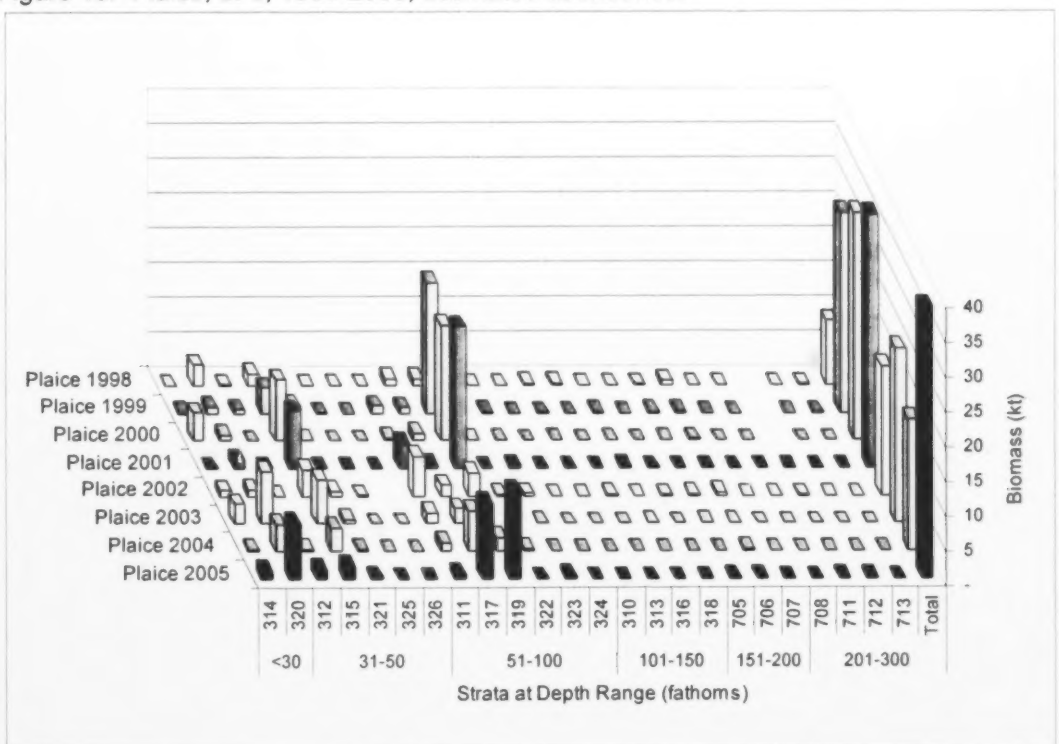


Figure 19. Plaice, 3Ps, 1998-2005, estimated biomass.

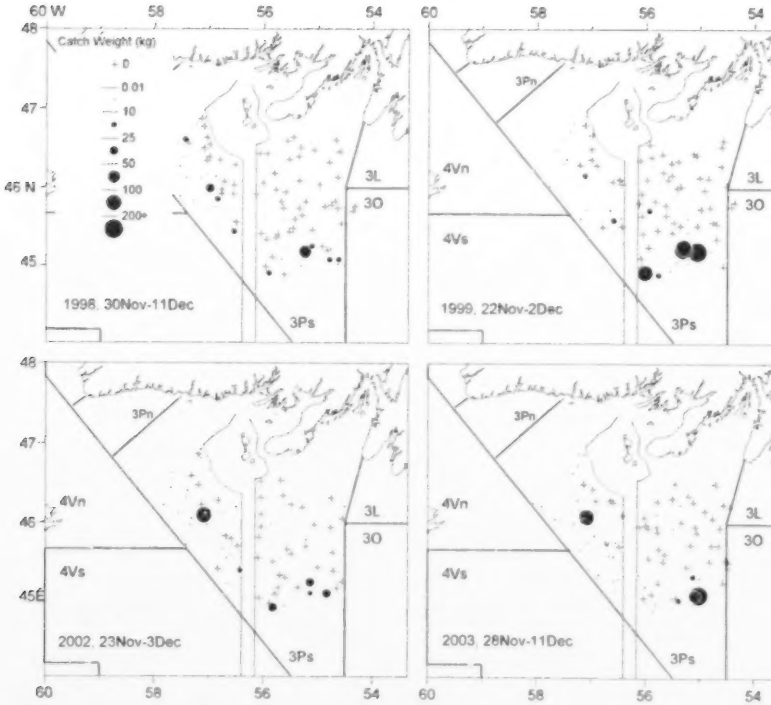
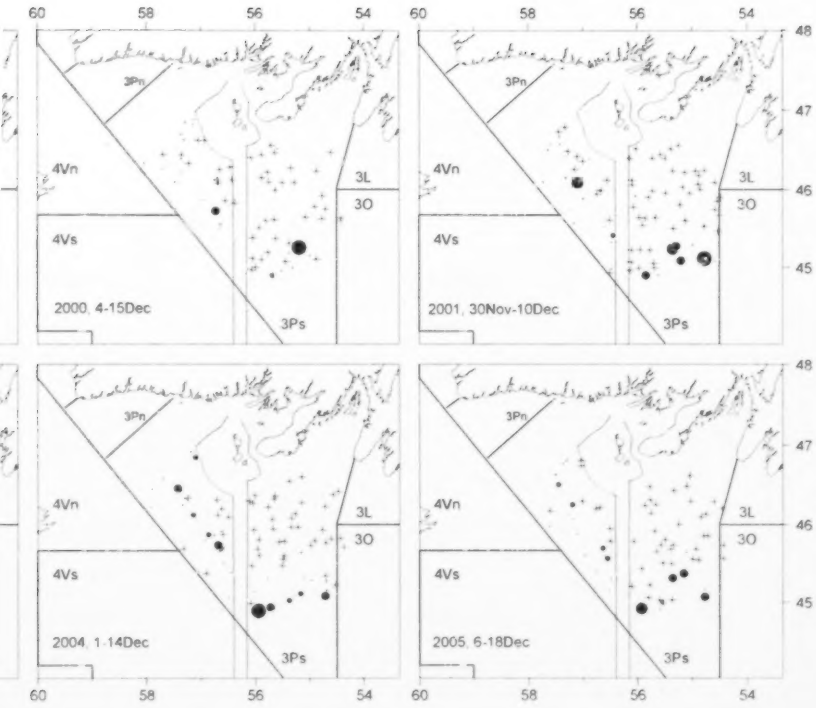


Figure 20. Witch catch weight distribution from GEAC stratified r
800 m depth contours are shown.



andom surveys, Subdivision 3Ps, 1998-2005. The 200, 400, and

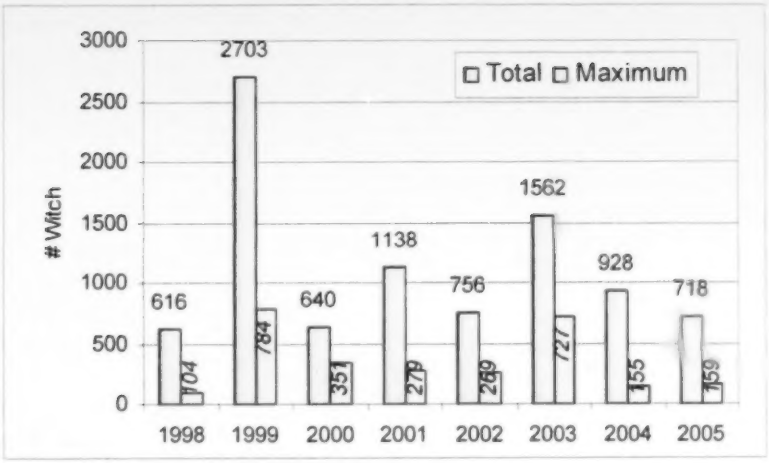


Figure 21a. GEAC fall 3Ps witch numbers.

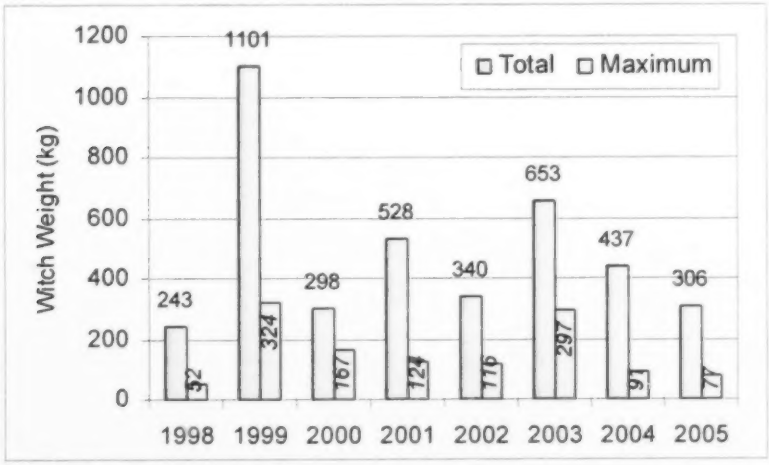


Figure 21b GEAC fall 3Ps witch weights.

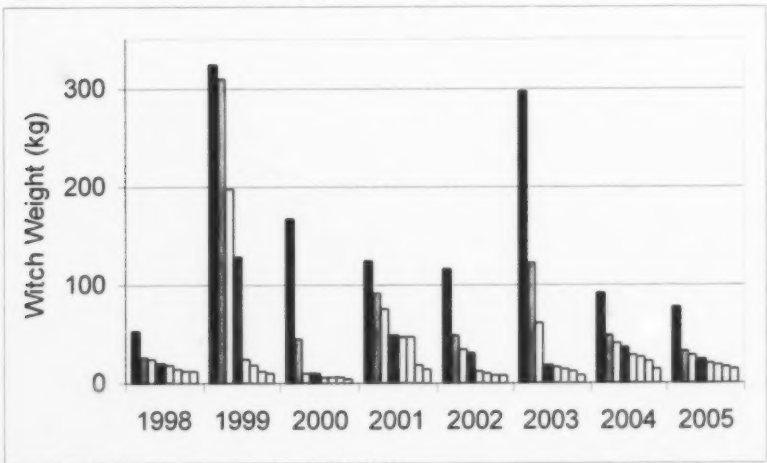


Figure 21c. GEAC fall 3Ps: largest witch set weights.

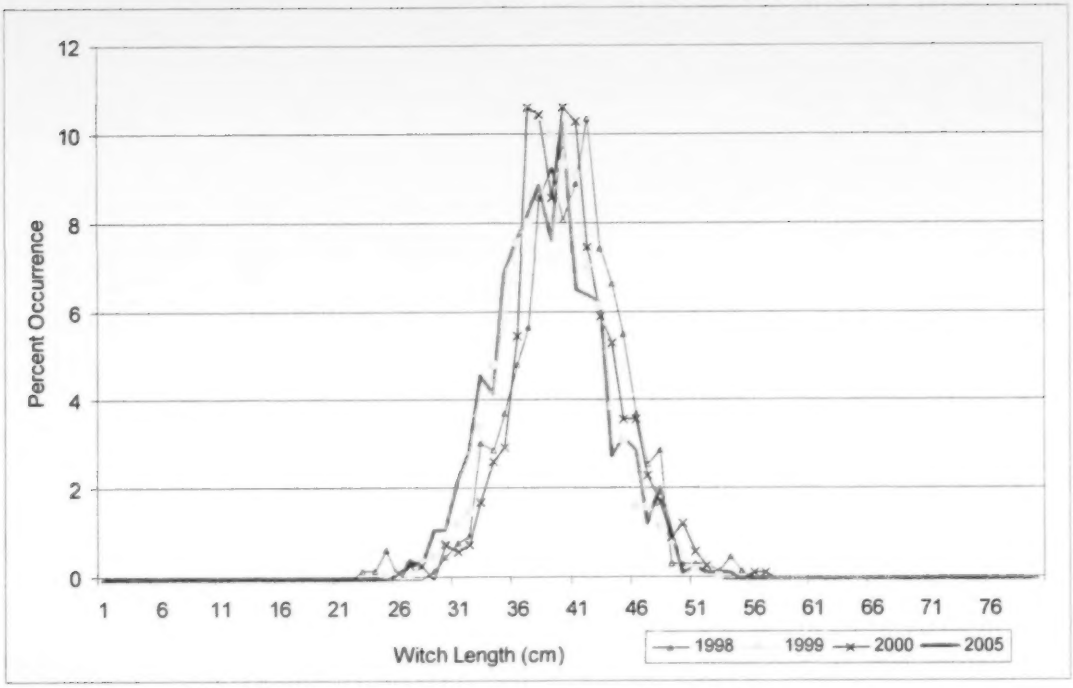


Figure 22a. Length composition of 3Ps witch: 1998-2000, 2005.

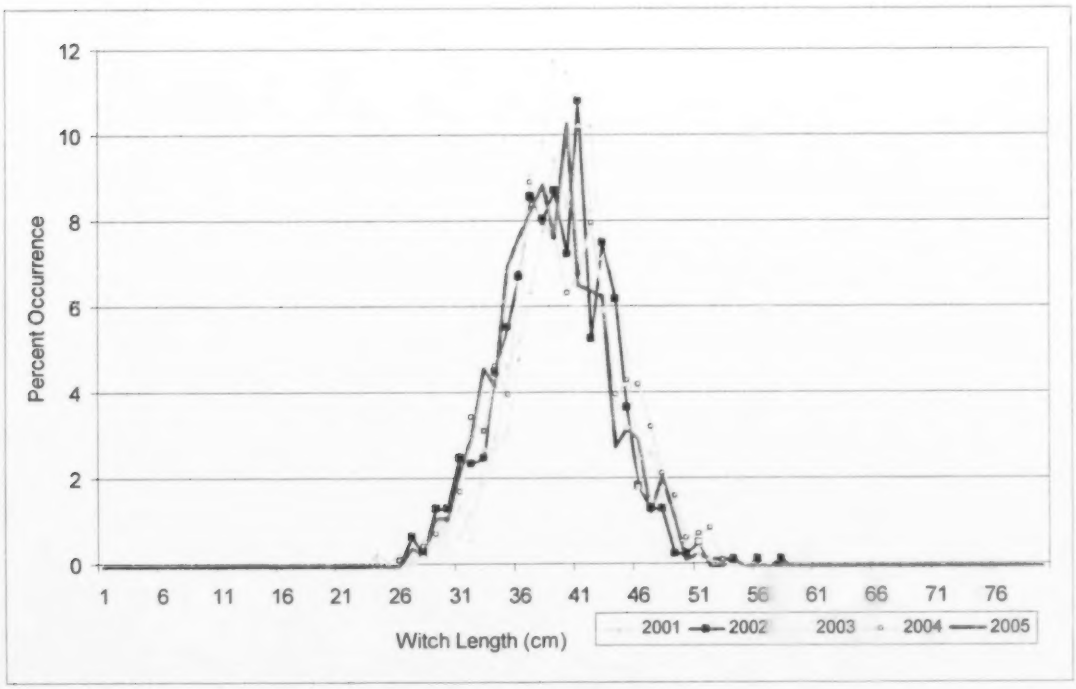


Figure 22b. Length composition of 3Ps witch: 2001-2005.

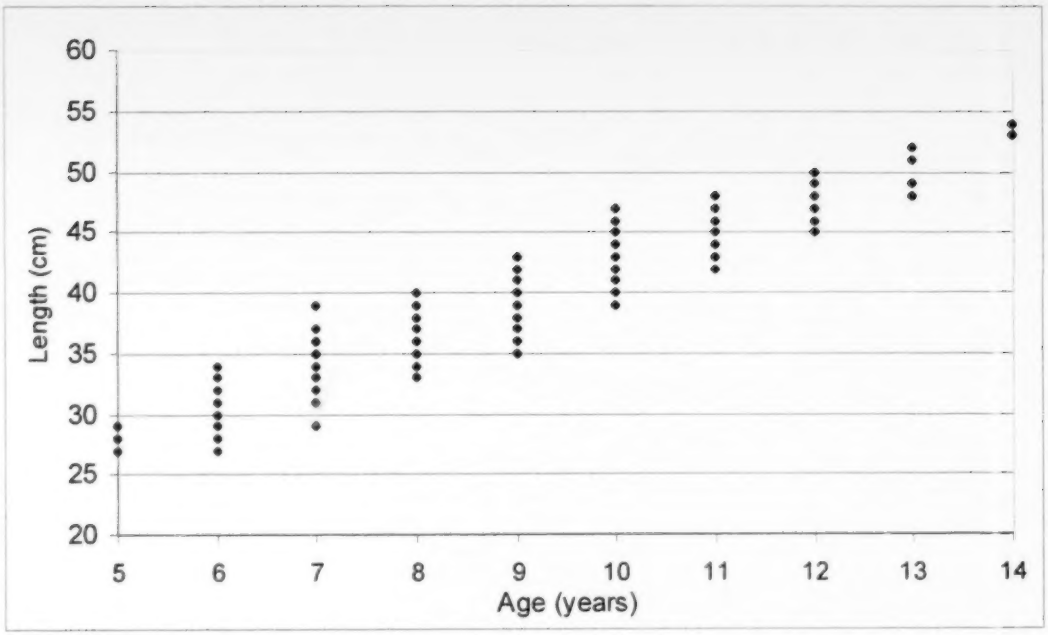


Figure 23a. Witch age-length composition 3Ps 2005 (452 samples).

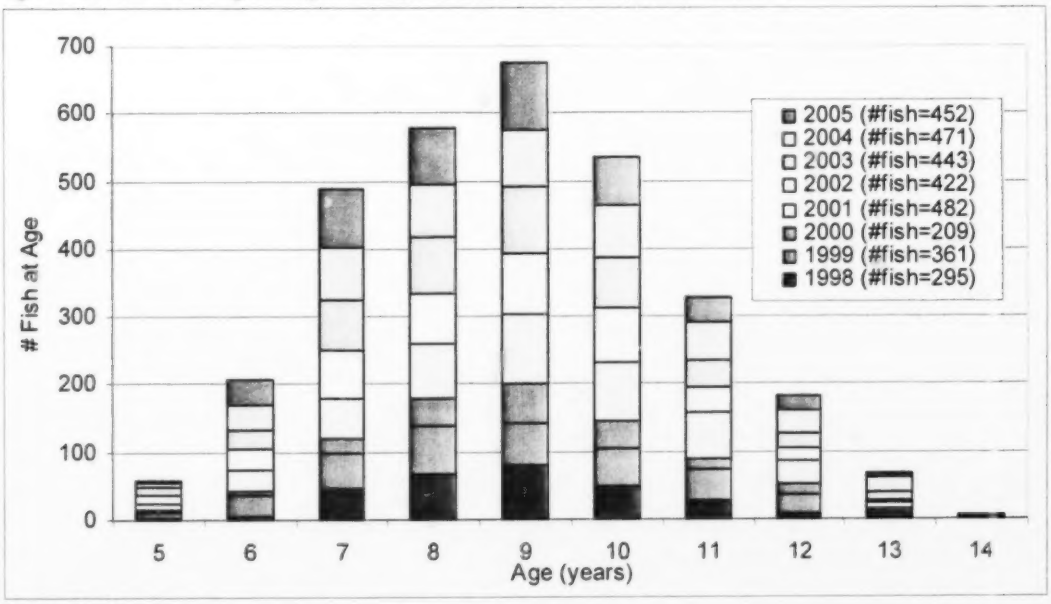


Figure 23b. Age composition of 3Ps sampled witch.

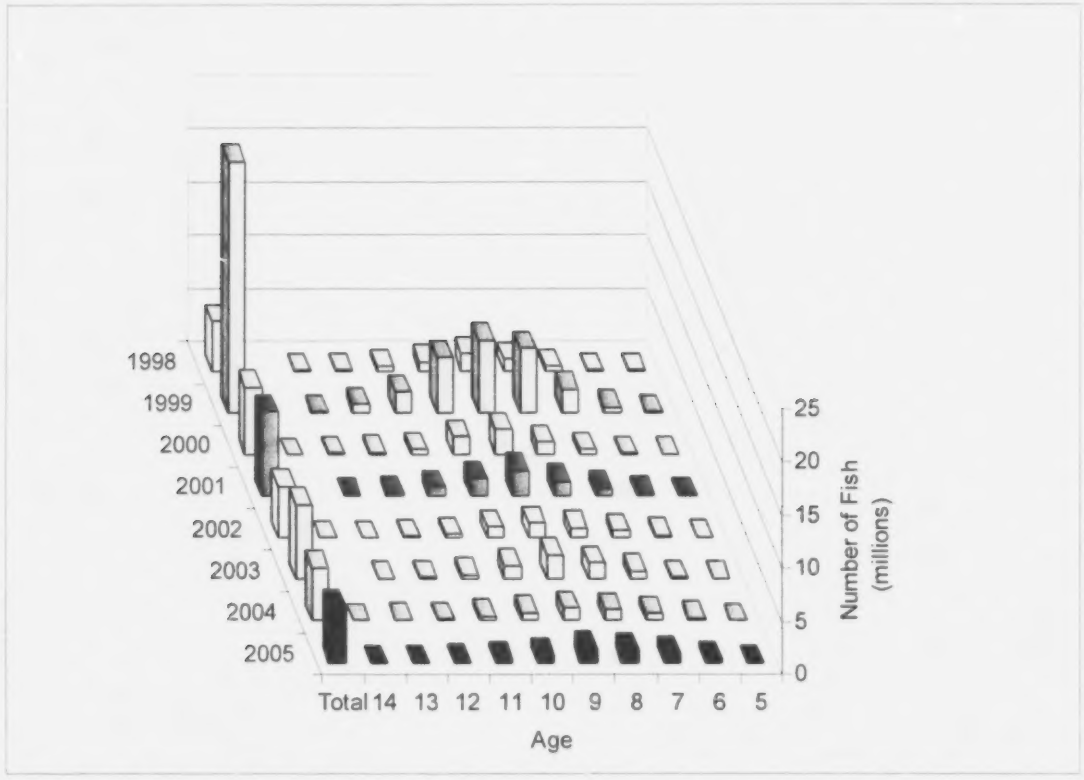


Figure 24. Witch, 3Ps, 1998-2005, estimated age composition.

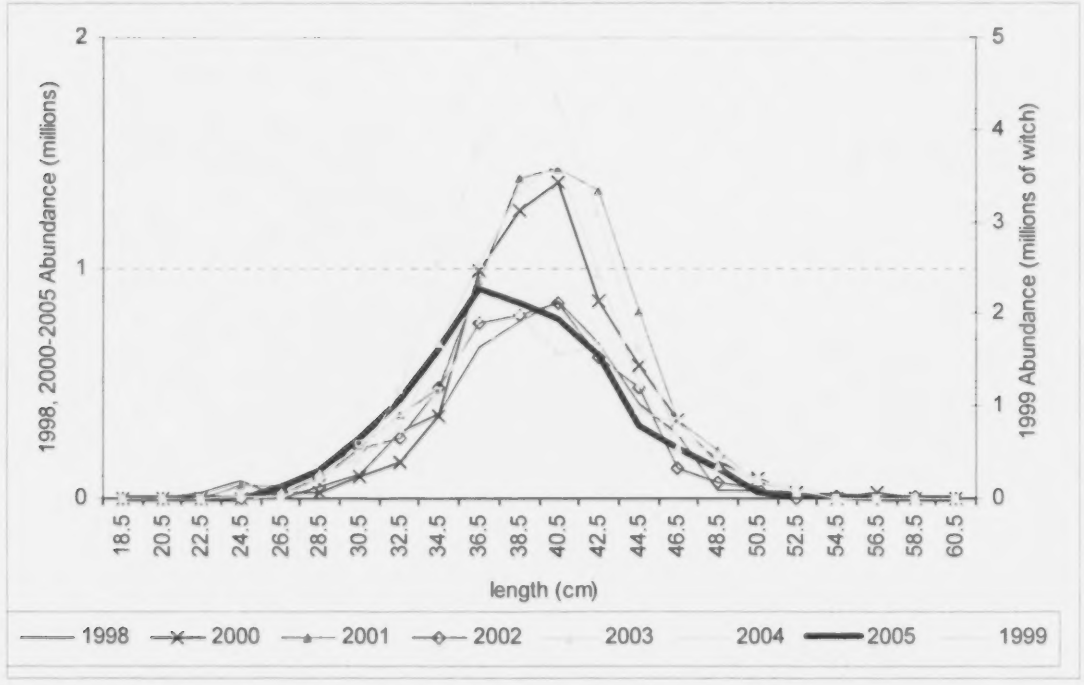


Figure 25. Witch survey abundance index at length, 3Ps, 1998-2005.

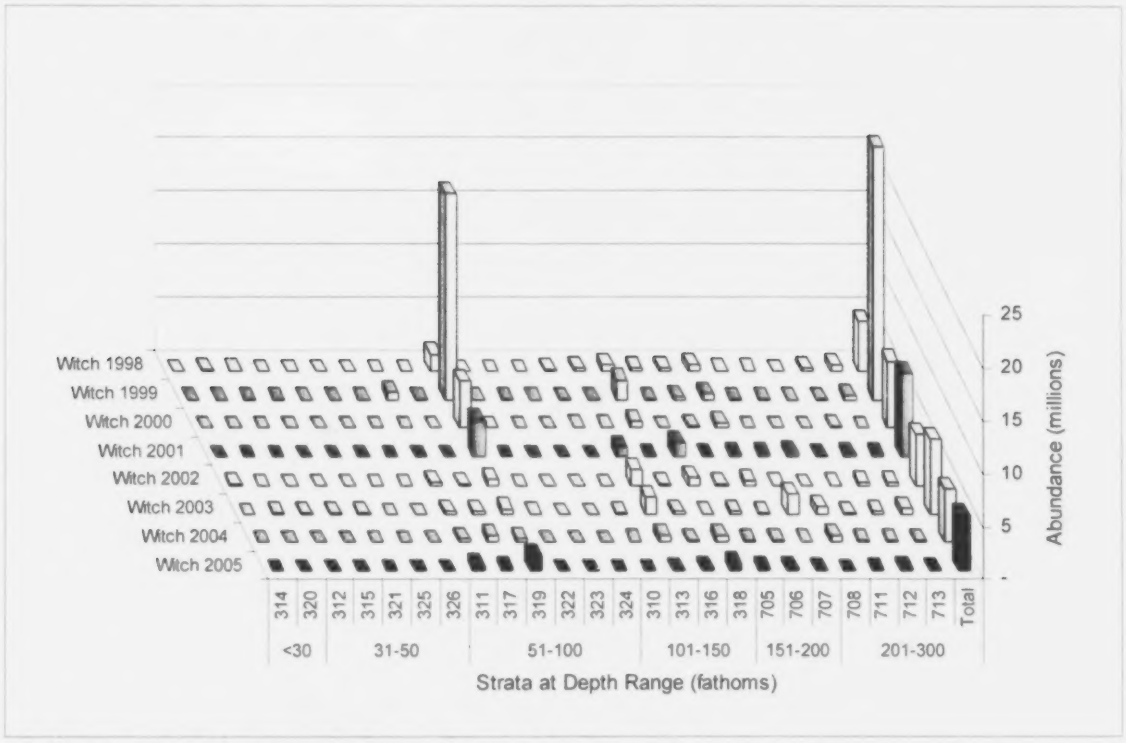


Figure 26. Witch, 3Ps, 1998-2005, estimated abundance.

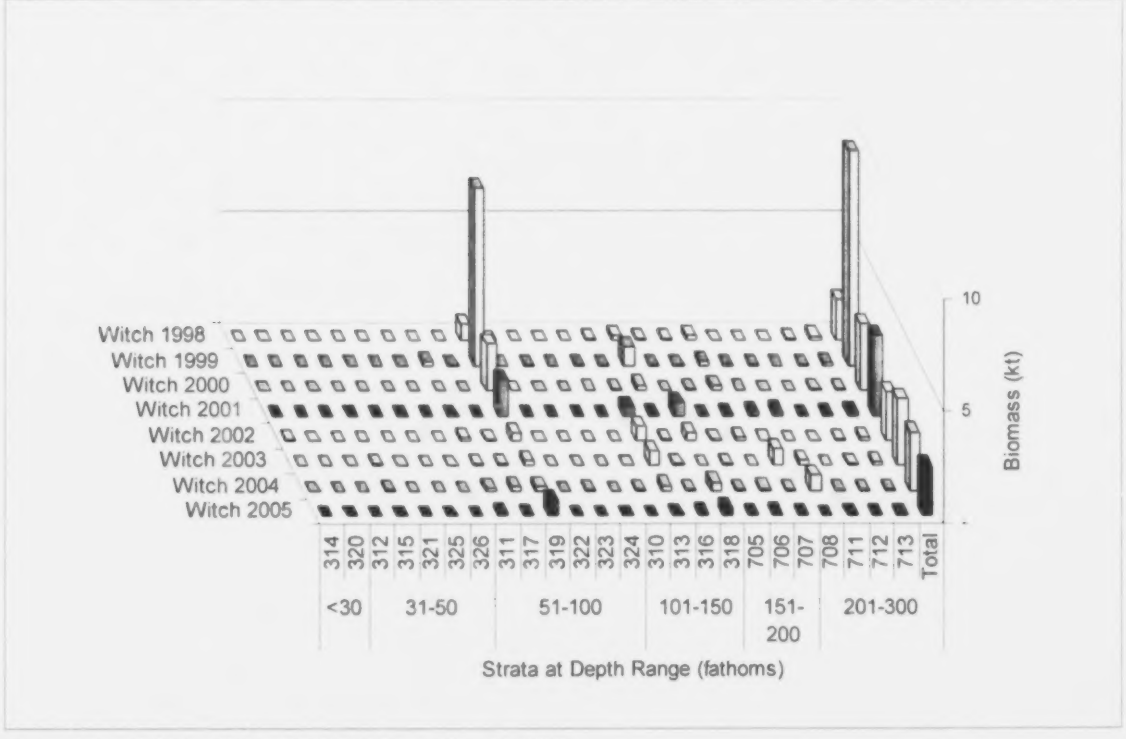


Figure 27. Witch, 3Ps, 1998-2005, estimated biomass.

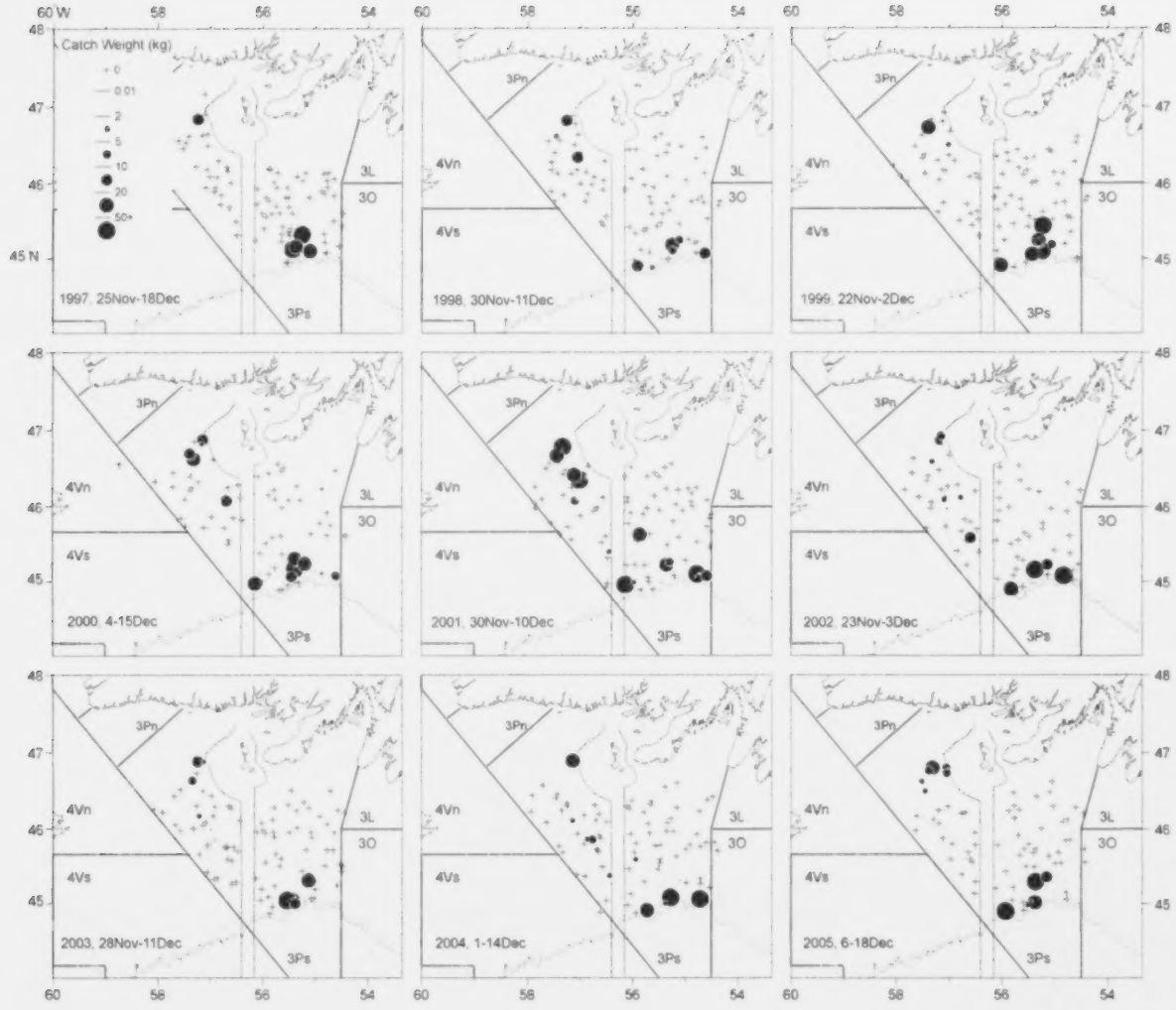


Figure 28a. Haddock catch weight distribution from GEAC stratified random surveys, Subdivision 3Ps, 1997-2005. The 200, 400 and 800 m depth contours are shown.

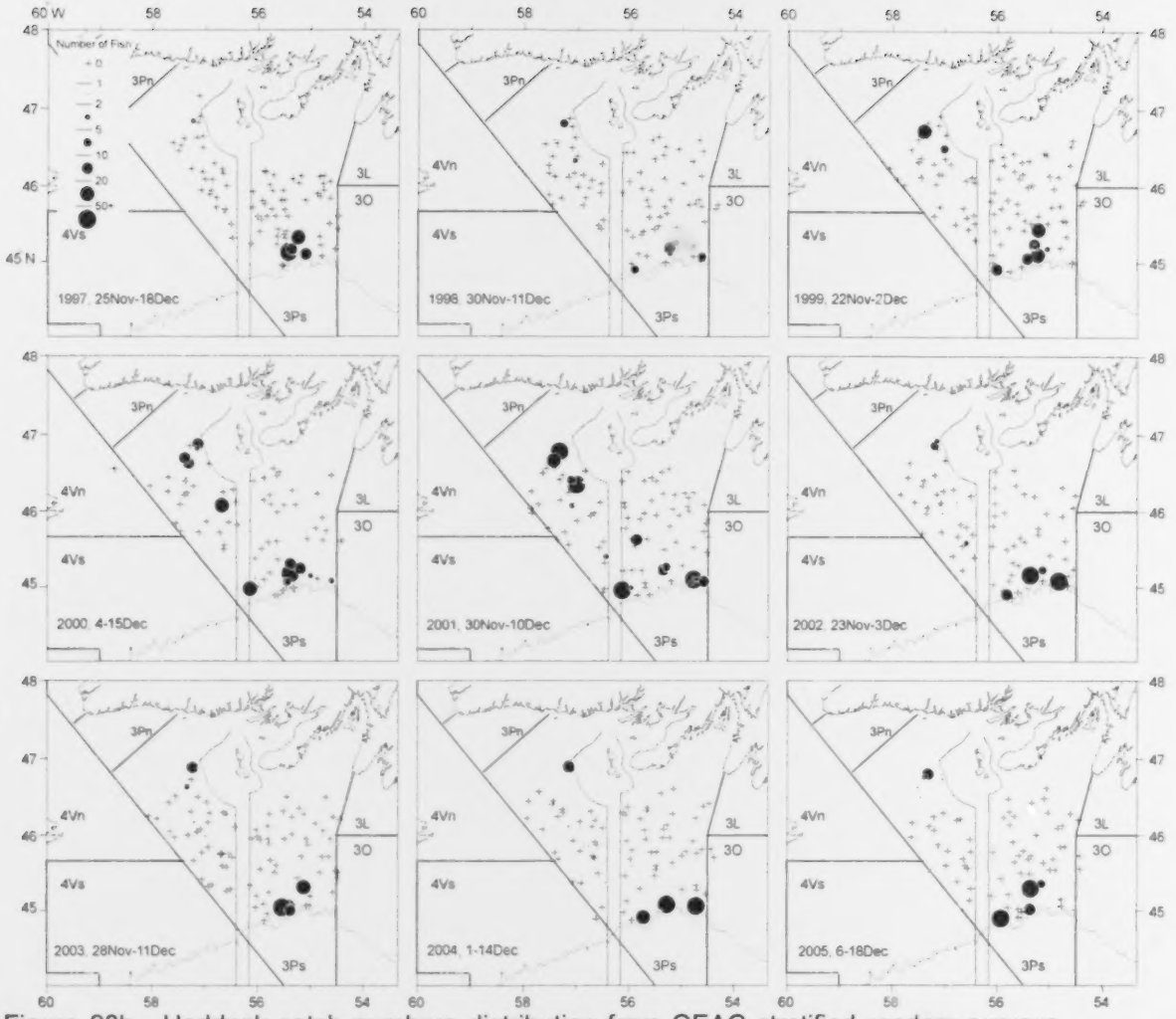


Figure 28b. Haddock catch numbers distribution from GEAC stratified random surveys, Subdivision 3Ps, 1997-2005. The 200, 400, and 800 m depth contours are shown.

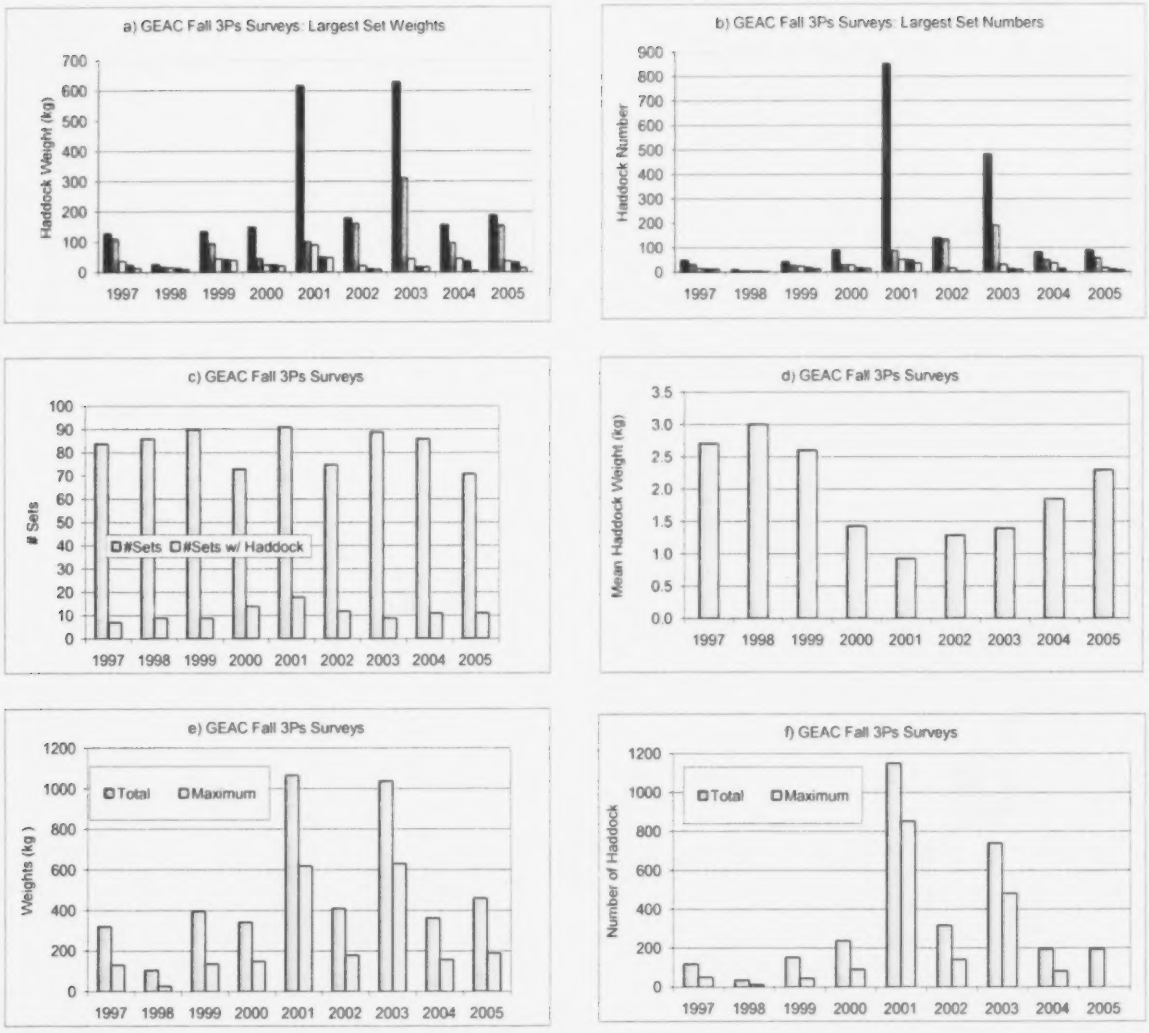


Figure 29. Haddock Catch Summary Statistics: a) largest set weights; b) largest set numbers; c) number of sets fished; d) mean weight; e) survey weights; f) survey numbers.

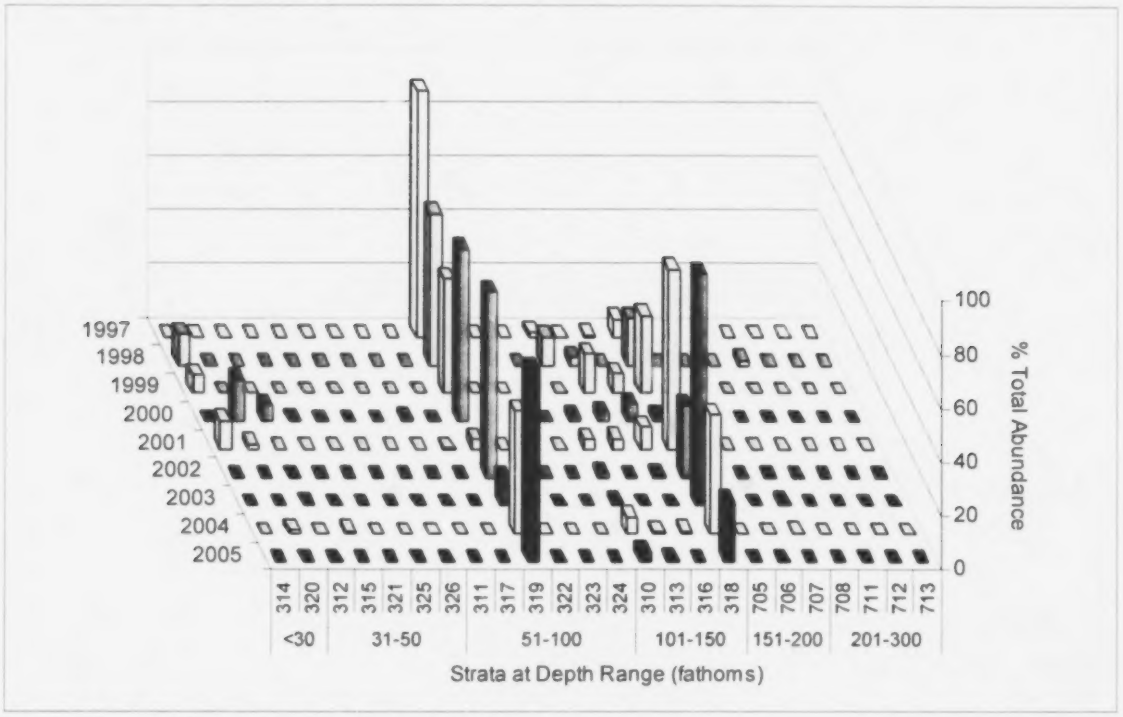


Figure 30. Haddock, 3Ps, 1997-2005, % total abundance.

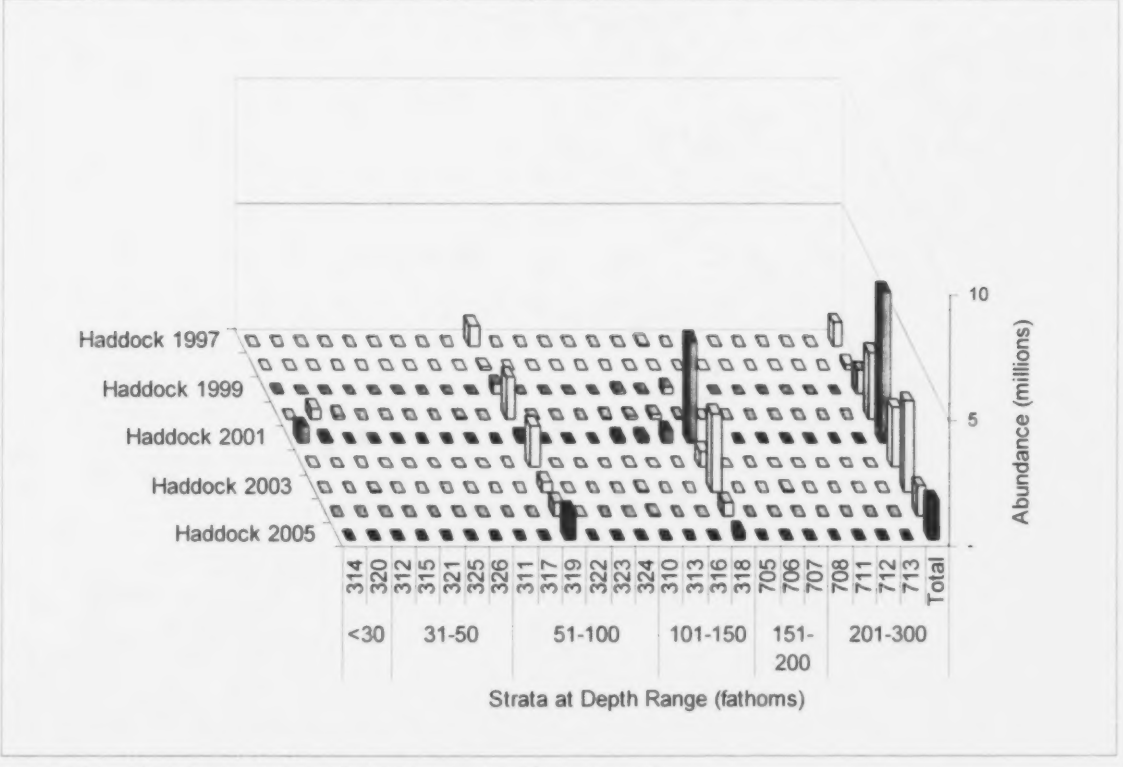


Figure 31. Haddock, 3Ps, 1997-2005, estimated abundance.

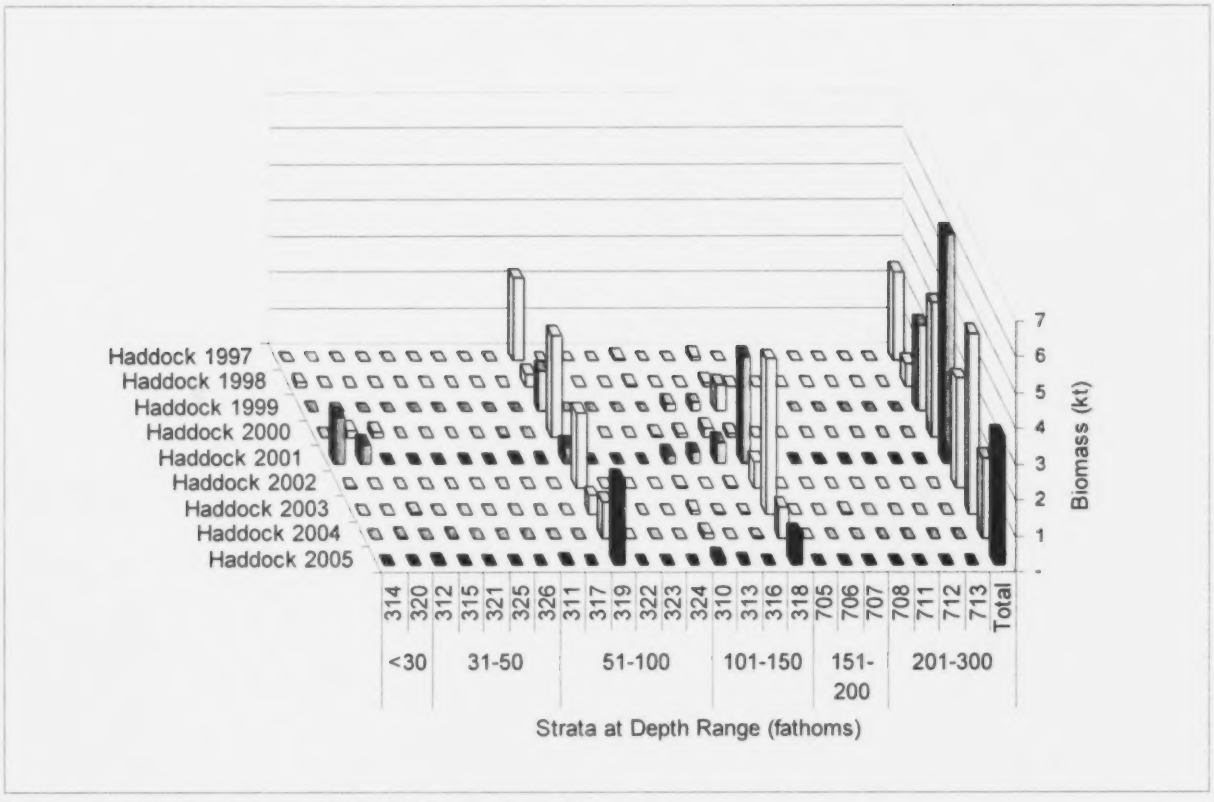


Figure 32. Haddock, 3Ps, 1997-2005, estimated biomass.

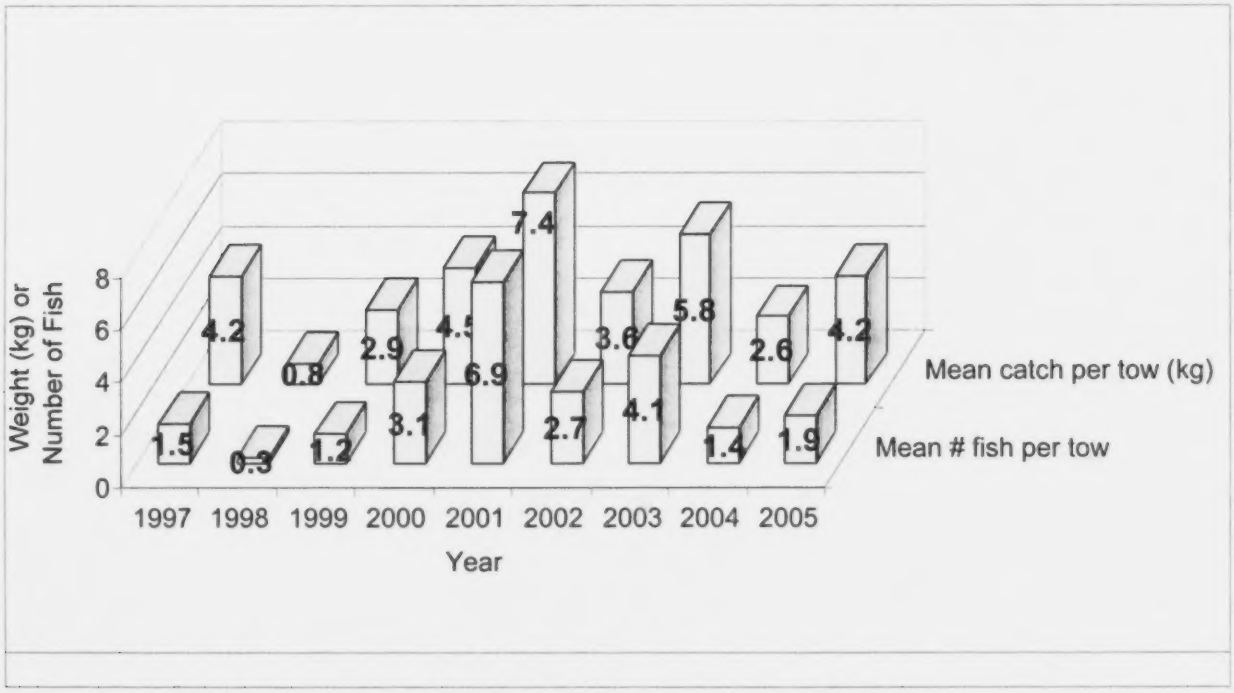


Figure 33. Haddock, 3Ps, 1997-2005, STRAP-estimated mean values per tow.